Record of Decision (PAD 001933175)
SHARON STEEL FARRELL WORKS
SUPERFUND SITE
OPERABLE UNIT ONE

November 2006

PREPARED BY
THE U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION III

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SHARON STEEL FARRELL WORKS SUPERFUND SITE

PART I: DECLARATION

A. SITE NAME AND LOCATION

Sharon Steel Farrell Works Superfund Site
Hermitage Township, City of Farrell, Pennsylvania (PA)
EPA ID#PAD 001933175

B. STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedy for the Sharon Steel Farrell Works Superfund Site ("SSFW"Site), located in Hermitage Township, City of Farrell, Pennsylvania. The remedy was developed and selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, (CERCLA), 42 U.S.C.§§ 9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision is based on the Administrative Record for this Site. The Administrative Record for this Site is located at both the Environmental Protection Agency (EPA), Region III Office, located at 1650 Arch Street in Philadelphia, PA and the Stey Nevant Library, located at 1000 Roemer Blvd. in Farrell, PA.

The Commonwealth of Pennsylvania has concurred with the selected remedy.

C. ASSESSMENT OF THE SITE

The response action selected in this Record of Decision (ROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable (NCP §300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund Site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. The Sharon Steel Farrell Works Superfund Site (SSFWS) has been characterized as having slag and sludge as the source material on Site, which is located on the Northern and Southern portion of the Site. The risks in the slag and sludge material are driven by high concentrations of metals. To address these principal threat wastes, the selected remedy includes the application of a biosolid cap over the slag and sludge source to reduce the mobility of metals in the source material and minimize the infiltration of the metals from slag and sludge into the groundwater and migration of metals-contaminated dust from slag and sludge source material to the surrounding area.

D. DESCRIPTION OF THE SELECTED REMEDY

The SSFW Site will be separated into the following two operable units for purposes of remedy implementation: OU-1 includes the Northern and Southern areas which consist of approximately two hundred and ninety two acres and OU-2 includes the asphalt plant and trucking storage company properties totaling approximately thirty three acres. There will be a separate Proposed Plan for OU-2. The selected remedy described below is the response action for the OU-1 component of the Site. The remedy addresses contaminated slag and sludge at the Site and includes the following major components:

I. Regrading, contouring and treatment of the slag and sludge source material with a Biosolid Cap. There is a phased approach planned for the implementation of the Biosolid Cap;

II. Stabilization of the eroded Shenango River banks;

III. Institutional controls to protect remedy, restrict land and groundwater use on Site; and

IV. Design and implement a long-term monitoring plan for groundwater, surface water and sediment for protection of human health and the environment and to evaluate remedy performance.

E. STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate requirements to the remedial actions, is cost effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected remedy also satisfies EPA's statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

The remedy selected in this ROD will, leave hazardous substances, pollutants, or contaminants on-Site above levels that will not permit unrestricted use of the Site. Therefore, EPA will continue to conduct Five-Year Reviews to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary of this ROD. Additional information can be found in the Administrative Record file for this Site.

ROD CERTIFICATION CHECKLIST	
Information	**Location/Page number**
Chemicals of concern and respective concentrations	Tables 1 and 2
Baseline risk represented by the chemical of concern	Tables 1 and 2
Clean-up levels established for chemicals of concern and the basis for these levels	Page 52
How source materials constituting principal threats are addressed	Section XI/48
Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and the ROD	Section VI/19
Potential land and groundwater use that will be available at the Site as a result of the Selected Remedy	Section XII/49
Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected	Table 3
Key factors that led to selecting the remedy	Section XII/49

______________________________ ____________________

James J. Burke, Director — Date
Hazardous Site Cleanup Division
EPA, Region III

RECORD OF DECISION
SHARON STEEL FARRELL WORKS SUPERFUND SITE
OPERABLE UNIT #1

PART II: DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

The Sharon Steel Farrell Works Superfund Site ("SSFWSite") is located approximately one mile southwest of the City of Farrell, Mercer County, Pennsylvania and approximately 300 hundred feet east of the Pennsylvania/Ohio border (Figure 1). It is approximately 300 acres in size. Land use in the area is industrial to the north and east, and rural to the west and south. The United States Environmental Protection Agency ("EPA") is the lead agency and has identified the Site as PAD981033459. The Pennsylvania Department of Environmental Protection ("PADEP") is the support agency. All parties have been identified for this Site and all investigations have been conducted by either EPA or PADEP.

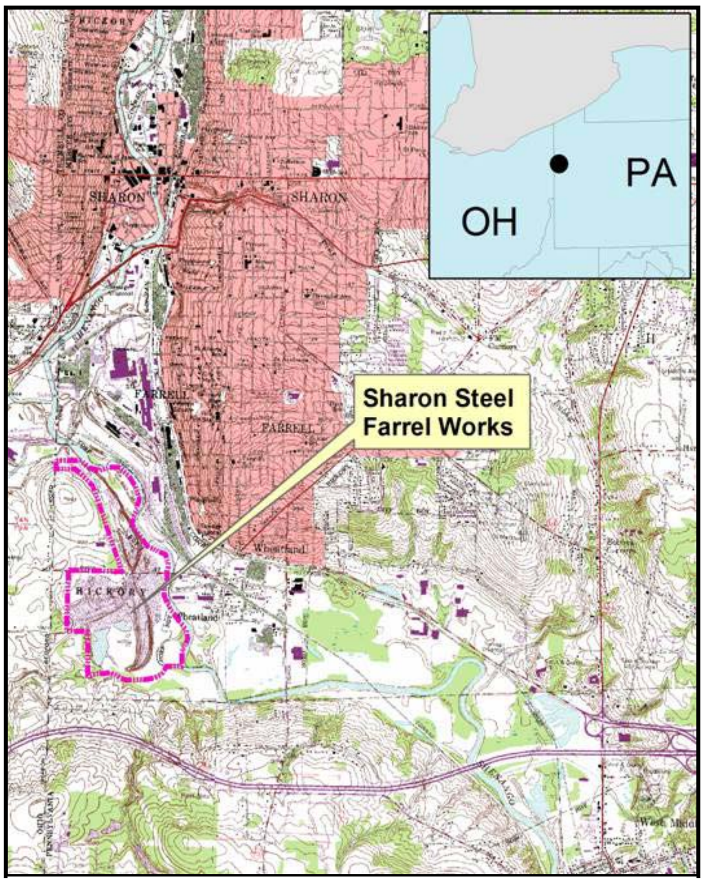

Figure 1: Site Location Map

The SSFW Site (See Figure 2) is comprised of three main areas: 1) The Northern Area, which consists of approximately sixty one acres and includes those portions of the Site which are north of Ohio Street-the Northern Slag Source Pile, the Basic Oxygen Furnace (BOF) Sludge Source Area; 2) An Asphalt Plant Property, a twenty seven acre area which includes an eight acre work area under the asphalt plant and a six acre property owned by a Trucking Company; and, 3) The Southern Area, which consists of approximately two hundred and thirty one acres and includes those areas south of Ohio Street-the Southern Slag Source Pile which are currently being mined by a Prospective Purchaser Party, and the wetlands/***floodplain*** located between the slag piles and the Shenango River (to the east) and the unnamed tributary (to the south) (see Figure 1 & 2). The Prospective Purchaser Party operates an active slag mining operation on the Southern portion of the Site permitted by

Pennsylvania Department of Environmental Protection (PADEP) and authorized by EPA pursuant to a Prospective Purchasers Agreement. The Prospective Purchaser Party will reduce the volume of contaminated waste slag at the Site by continuing to mine and remove slag from the Southern Area. Mining is expected to remove over 3 million cubic yards of slag from the Site which is beneficially reused to make road aggregate. However, due to technical limitations (groundwater dewatering) and cost/benefit considerations, the Prospective Purchaser Party will not remove the last four feet of slag. This will leave four feet of slag over the original native soil in the Southern Area.

The SSFW Site will be separated into the following two operable units (OU) for purposes of remedy implementation: OU-1 includes the Northern and Southern areas, approximately two hundred and ninety two acres.

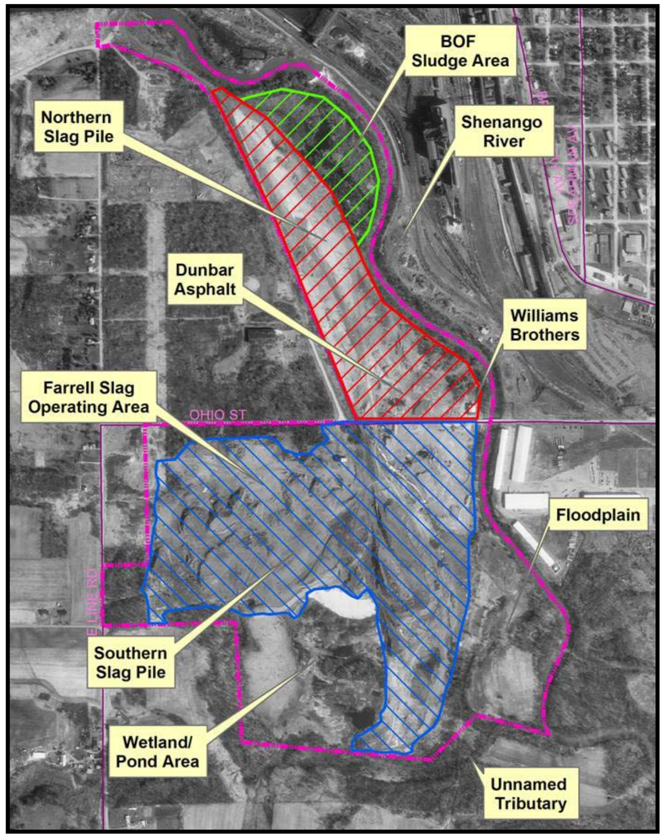

Figure 2: Site Features

OU-2 includes the asphalt plant and trucking storage company properties totaling approximately thirty three acres. There will be a separate Proposed Plan for OU-2.

II. SITE HISTORY and ENFORCEMENT ACTIVITIES

The SSFW Plant, located across the Shenango River to the northeast of the subject Site, was founded in 1900 and began to manufacture a variety of steel products. Throughout the operating history of the plant, waste and byproducts of the manufacturing process were transported on rail cars across the Shenango River (via bridge) and side-cast down embankments or piled into large mounds in several areas adjacent to the Shenango River on the subject Site. From 1949 to 1981, waste liquids (acids and oils) were poured onto the hot slag wastes which were subsequently disposed at the Site. This practice continued until 1981, when Sharon Steel was ordered by PADEP to stop disposing the waste liquids in this manner. Although the disposal of waste liquids stopped in 1981, Sharon Steel continued to stockpile slag at the Site until operations at the plant stopped in 1992. PADEP conducted several inspections of the waste disposal areas in the 1970's and concluded that Sharon Steel was responsible for the lack of biological community along at least 11.5 miles of the Shenango River.

In 1992, after Sharon Steel Corporation declared bankruptcy, the plant shut down and waste disposal at the Site stopped. The EPA is not addressing the Sharon Steel Plant which is east of the Shenango River in its cleanup because the Sharon Steel Plant is not part of the Sharon Steel Farrell Works Superfund Site. The Sharon Steel Farrell Works Site is the abandoned area west of the Shenango River and is the area where slag and sludge was disposed of from the Sharon Steel Plant. Since the Site was no longer in operation, it was evaluated under CERCLA. The Sharon Steel Plant is under State jurisdiction with Pennsylvania Department of Environmental Protection (PADEP) and being addressed by under the voluntary cleanup program, under the current property owners.

In August 1993, samples of groundwater, soil, ***sediment***, and surface water were collected during an Expanded Site Investigation (ESI) to support the preparation of a ***Hazard Ranking System (HRS)*** score. The HRS score is used to justify placing a Site on the ***National Priorities List (NPL),*** a list of the most serious uncontrolled or abandoned hazardous waste Sites requiring long-term clean up actions. The investigation identified metals and organic compounds at the Site. Based on the findings of the ESI , the SSFW Site was recommended for HRS scoring in 1995. The HRS package was completed in February 1998, and the Site scored 50.00 to warrant listing on the NPL. On March 6, 1998, the Site was proposed for inclusion to the NPL. It was formally added to the NPL on July 28, 1998, making it eligible for Federal clean-up funds.

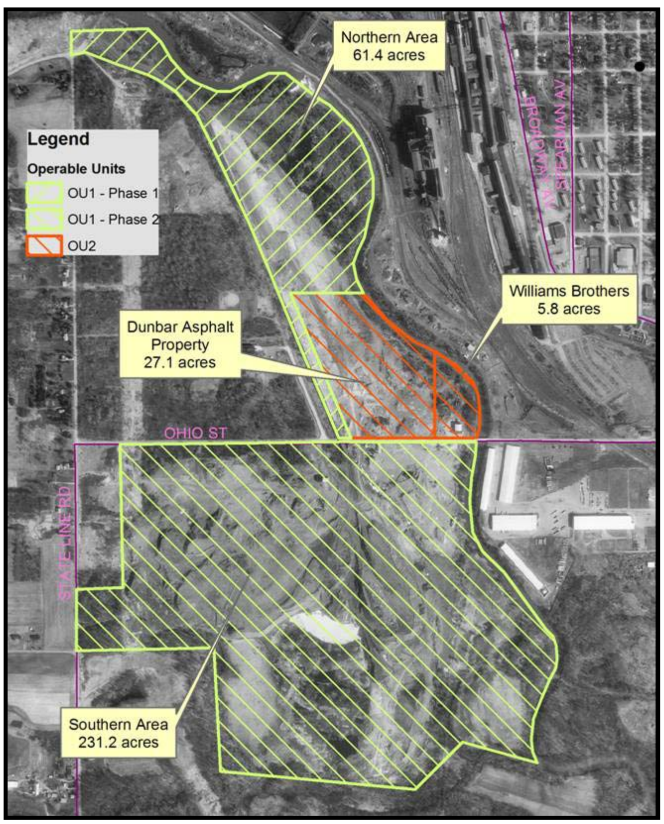

Figure 3: Operable Units and Land Ownership

In October 1999, EPA initiated a ***Remedial Investigation and Feasibility Study (RI/FS)*** for the Site to evaluate existing data; collect additional data, as necessary; and assess and consider appropriate actions. Due to the size and complexity of the Site, the RI was conducted in two phases. Phase 1, included monitoring well installation, groundwater evaluation, groundwater sampling, surface water and sediment sampling, slag and sludge sampling, preliminary ***air/dust dispersion modeling***, and preliminary ***risk assessments.*** It was completed in early June 2001. Phase 2, which was completed in early 2004, included additional groundwater sampling, surface and subsurface soil sampling, residential well sampling, surface water and sediment sampling, biota sampling (fish, crayfish, amphibians, mammals, and reptiles), slag/sludge sampling in disposal areas, and final human health and ecological risk assessments. The results of the Phase 1 and 2 investigations are summarized in the Final RI report, dated June 2005. The RI report indicated that there were unacceptable risks to human health and the environment; therefore, remedial actions would be required to control, reduce, or eliminate these risks. An FS report was prepared in April 2006 to develop an appropriate range of remedial actions for managing wastes and contaminated areas on the Site in a manner that will protect human health and the environment and meet ***applicable or relevant and appropriate requirements*** (***ARAR***).

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

On July 16, 2006, pursuant to Section 113(k)(2)(B) of CERCLA, 42 U.S.C. § 113(k)(2)(B), EPA released for public comment the Proposed Remedial Action Plan ("Proposed Plan") setting forth EPA's preferred remedial alternatives for the Site. The Proposed Plan was based on documents contained in the Administrative Record File. EPA made these documents available to the public in the EPA Administrative Record Room in EPA Region III's office located at 1650 Arch Street in Philadelphia, Pennsylvania, and at the local information repository at the Stey Nevant Library located at 1000 Roemer Blvd in Farrell, Pennsylvania. A notice of availability of these documents was published in the Sharon Herald and Ohio Vindicator on July 16, 2006. EPA opened a 30-day public comment period on July 16, 2006 to receive comments on EPA's preferred alternative and the other alternatives considered in the Proposed Plan. On July 18, 2006 EPA distributed a fact sheet to the community summarizing progress on the Sharon Steel Farrell Works Site and informing the public of when and where the public meeting for the Sharon Steel Proposed Plan would be. Comments received during this public comment period, as well as EPA's response to such comments, are summarized in the Responsiveness Summary section of this Record of Decision ("ROD"). EPA and PADEP also held a public meeting on July 26, 2006 at the Stey Nevant Library. A detailed discussion of the recent community activities is presented in Section X under the subheading "Community Acceptance."

More detailed documentation on the information contained in this ROD may be found in the Administrative Record. The Administrative Record contains the Remedial Investigation, Feasibility Study, and other information used by EPA in the decision making process. EPA encourages the public to review the Administrative Record in order to gain a more comprehensive understanding of the Site and the activities that have been and will be conducted there. The Administrative Record can be viewed at the Stey Nevant Library located at 1000 Roemer Blvd. in Farrell, Pennsylvania and is also available at the EPA Region III's Office located at 1650 Arch Street in Philadelphia, Pennsylvania. To review the Administrative Record at EPA's Philadelphia office, contact Ms. Anna Butch, Administrative Record Coordinator, at (215) 814-3157. The Administrative Record can also be accessed on the web at www.epa.gov/arweb. Copies of this ROD are available for public review in these information repositories.

IV. SCOPE AND ROLE OF OPERABLE UNIT

This ROD presents the information necessary to inform the public of the existing contamination at the Site, risk associated with the exposure to contamination, and explains EPA's selected remedy. The ROD also addresses all the remedial activities that are necessary to remediate the Northern and Southern Areas of the Site (OU-1). OU-2 includes the asphalt plant and trucking storage company properties totaling approximately thirty three acres. There will be a separate Proposed Plan for OU-2.

The ROD addresses exposure to the slag and sludge. The primary goals of the remedial action are to prevent dust migration and direct contact with contaminated waste materials, immobilize metals in the soil/waste, decrease migration of contaminants passing through wastes, and restore wildlife habitat to barren lands by re-grading the Site and covering it with a vegetated biosolid material. Although shallow groundwater under the slag areas has elevated levels of contaminants, there are no current residents using the shallow groundwater for drinking purposes. Potential future use of the Site groundwater will be restricted by institutional controls. The vegetated biosolid cover will immobilize contaminants by reducing the precipitation that can pass through it into the waste materials, and this in turn, will reduce the concentration of contaminants entering the groundwater and discharging into the Shenango River and the wetland/unnamed tributary. Ultimately, this remedial action should reduce the overall amount of contamination in groundwater which enters the Shenango River from the SSFW Site.

Other elements of this clean-up will include the following:

1. Creation of a surface drainage collection system to minimize the amount of surface runoff passing through surface soils and prevent erosion of surface material into adjacent wetlands and streams.
2. Re-establishment of a more natural floodplain along the Shenango River and implementation of erosion protection to prevent the erosion of waste slag and sludge into the Shenango River and the wetland/pond area:
    a. Streambank stabilization of the west bank of the Shenango River along its frontage with the SSFW Site by moving slag piles away from the Shenango River and anchoring plants to stabilize the area.
    b. Silt fencing will be anchored along the north perimeter of the wetland/pond habitat to prevent the inflow of eroded material from the adjacent slag piles into the wetland.
    c. Enhance the vegetative buffer between the Site wetlands and off-site wetlands/pond to help further control potential migration of COCs in sediment.
3. Installation of perimeter fencing to prevent trespassing and unauthorized recreational activities until the biosolid cover is established.
4. Long-term monitoring to measure decreases in ***contaminant loads*** to the groundwater, surface water and sediment on Site.
5. Establishment of institutional controls to minimize health exposure risks to regulate future land use so that the biosolid cap is not damaged and to prohibit shallow contaminated groundwater under the Site from being used for drinking water purposes on Site.

V. SITE CHARACTERISTICS

A. Geographical, Topographical, and Hydrogeological Features

The SSFW Site is approximately 300 acres in size and located approximately one mile southwest of the City of Farrell, Mercer County, Pennsylvania and the Site is also located approximately 300 hundred feet east of the Pennsylvania/Ohio border (Figure 1). Land use in the area is industrial to the north and east and rural to the west and south.

The SSFW Site is located within the ***glaciated*** section of the Appalachian Plateaus Physiographic Province in Mercer County, Pennsylvania. Regional topography consists of hilly uplands and broad deep valleys cut by the Shenango River. The Shenango River valley contains Quaternary glacial and alluvial deposits, while the upland areas consist of glacial till. Regionally, glacial deposits are underlain by Mississippian and Pennsylvanian aged bedrock consisting of shale and sandstone with some thin beds of limestone, coal, and fireclay. At the Site, the Shenango River has completely eroded the Pennsylvanian bedrock and as a result, the glacial and alluvial deposits beneath the Site are directly underlain by Upper Mississipian bedrock of the Pocono Group. The Site is located on the western floodplain of the Shenango River between the river and the Ohio/Pennsylvania state boundary.

The slag and sludge wastes are extremely porous and most rainfall infiltrates the wastes and becomes groundwater. The limited surface runoff from the Northern Area, including the Dunbar Asphalt Plant, flows overland and eastward into the Shenango River or collects in the sunken landform within the Northern Area. Drainage from the northern portion of the Southern area flows overland in a northward direction into a wetland area bisected by Ohio Street or collects in the sunken landform within the source area. There is no direct surface connection between this wetland area and nearby surface water features. Any hydraulic connection to nearby surface waters is through groundwater. Drainage from the southern portion of the Southern area flows overland in a southward direction into the emergent wetland/pond area or into the unnamed tributary. Both the emergent wetland/pond complex and the unnamed tributary ultimately flow into the Shenango River.

Groundwater

Site-related contamination from the Northern and Southern Areas has been detected in groundwater which flows under the Site. Groundwater occurs under the Site in four main water bearing units (***aquifers)***. These four aquifers include: 1) an uppermost silty sand aquifer, which ranges in thickness from 0 to 30 feet; 2) an underlying silt and clay low permeability unit, approximately 30 to 70 feet thick; 3) a sand and gravel aquifer, approximately 70 to 120 feet thick; and 4) an underlying bedrock aquifer.

The two uppermost units contained elevated levels of metals and organic chemicals above drinking water standards. Groundwater in these areas moves towards the east and southeast. Depth to groundwater is approximately three to five feet below ground surface. At the BOF Sludge and the Northern Slag disposal areas, groundwater flow discharges to the Shenango River. At the Southern Slag disposal area, groundwater flow discharges to the wetland/pond complex, the unnamed tributary and the Shenango River. Groundwater flow in the lower two units is towards the north with some discharge to the Shenango River. The glacial till materials are extensive enough to produce a less permeable layer above the gravel zone and underlying bedrock. With the exception of barium and thallium, concentrations of Site-related constituents in the gravel and bedrock aquifers are generally consistent with regional ***background levels***. These observations suggest that there is no downward flow of contamination into the deeper confined aquifers. Flow in the deeper gravel and bedrock confined aquifers is generally to the north and east and does not discharge into the Shenango River. Wells in the confined aquifers indicated ***artesian conditions***.

Residential Wells

The majority of residences in the surrounding area receive their drinking water from the Shenango Valley Water Company which has two surface water intakes along the Shenango River at 3.5 miles upstream and 18 miles downstream of the Site.

Approximately 40 homes within 1 mile of the Site have domestic wells for water use. Well surveys have revealed that the wells for some of these residents, located west and southwest of the Site, are screened in the gravel and/or bedrock aquifers. Since groundwater flow in the Site gravel and bedrock aquifers is to the northeast, towards the Shenango River and away from the residential wells, these residents are not been impacted by the Site. Additionally, most metals and volatile organic compounds in groundwater on Site are contained in the upper two aquifers. Current residents have their drinking water wells in the lower bedrock aquifer, which contained only barium and thallium at levels of concern downgradient of their wells.

Wetland Habitats

There is a large (over 80 acre) ecologically important wetland complex located in the Southern Area. This complex includes emergent wetland areas, multiple ponds, a small unnamed tributary of the Shenango River, and associated forested floodplain/wetlands. The habitat supports a variety of birds, fish, amphibians, reptiles, and mammals.

The southern portion of the Site is encompassed on three sides by steep slag piles which are directly adjacent to the wetlands. In addition, there is a small pond with extremely alkaline conditions between the southern slag pile and the wetland. Some contamination from the waste piles enters the wetland directly through erosion of the piles. Some contamination is carried indirectly into the wetland by the discharge of contaminated groundwater from the base of the piles through the small pond. Given the low contaminant concentrations and the characteristics of the habitat, the wetland/pond area will be left intact and allowed to recover naturally once the sources of contamination are eliminated.

The entire wetland/pond area flows through a small channel which connects to the unnamed tributary of the Shenango River. There are also some places where groundwater from the Southern Slag pile discharges through ***seeps*** directly into the unnamed tributary. The sediment, and surface waters of the unnamed tributary and the soils of its floodplain contain some Site-related metals and organic compounds.

Shenango River

Site-related contamination from the waste areas has resulted in some contamination of adjacent floodplain soils located between the Site and the Shenango River. While contamination is not widespread, there are isolated depressions that contain elevated levels of metals and organic compounds. Shallow groundwater from the waste areas of the Site is known to discharge into the Shenango River and is a contributing source of contamination from the Site. Contamination related to the Site, primarily metals, was detected at elevated levels in sediment samples as far as 1 kilometer (km) downstream of the Site.

B. Sampling Activities and Extent of Contamination

1. Slag and Sludge Areas

The three source areas at the SSFW Site (BOF Sludge Disposal Area, Northern Slag Pile Area, and Southern Slag Pile Area) contain similar types of contaminants in soils, including metals, poly-aromatic hydrocarbons ("PAHs"), poly-chlorinated biphenyls ("PCBs"), and pesticides. Some semi-volatile organic compounds ("SVOC") such as: dibenzofuran, which are typically associated with PAH contamination were also detected at elevated concentrations in the source areas.

The BOF Sludge Disposal Area is generally the most contaminated source area in terms of the number of detected constituents and the concentrations of those constituents, mostly in surface soil and deep subsurface soil. In particular, 2-methylnaphthalaene and several metals (cadmium, chromium, copper, lead, mercury, silver, sodium, and zinc) were detected at higher concentrations than the other two source areas and were greater than background/reference concentrations. PAHs were detected at significant concentrations in the northern and southern ends of the BOF Sludge Disposal Area. Most of the contaminants detected in the BOF Sludge Disposal Area were also detected in downgradient Shenango River floodplain soils and in sediment in the Shenango River. This finding indicates that contamination migrates from the BOF Sludge Disposal Area to these low-lying areas via surface runoff and flooding.

The Northern Slag Pile Area is generally the least contaminated source area in terms of the number of detected constituents and the concentrations of those constituents. Metals, PAHs, pesticides, and PCBs were the most frequently detected constituents and were detected in all depth intervals; thus defining the vertical extent of contamination. The southern end of the Northern Slag Pile area contained notably high concentrations of metals. Most of the contaminants detected in the Northern Slag Pile Area were also detected in downgradient Shenango River floodplain soils, southeast floodplain soils, and in sediment in the Shenango River. This finding indicates that contamination migrates from the Northern Slag Pile Area to these low-lying areas via surface runoff and flooding.

Metals, PAHs, pesticides, and PCBs were the most frequently detected constituents in all depth intervals in the Southern Slag Pile Area. This area also contained volatile organic compounds (VOCs) and pesticides not detected in other source areas; however, these were detected relatively infrequently and at relatively low concentrations. The Southern Slag Pile Area, particularly the central portion of the area, contains concentrations of most PAHs, Aroclor-1248, DDT metabolites, and heptachlor epoxide that are notably higher than concentrations in the other two source areas. Most of the contaminants detected in the Southern Slag Pile Area were also detected in downgradient southeast floodplain soils, unnamed tributary floodplain soils and sediment, wetland ponds, and the Ohio Street wetlands. This finding suggests that contamination likely migrates from the Southern Slag Pile Area to these low-lying areas via surface runoff and flooding.

2. Soil-to-Surface Water/Sediment Migration

Contaminants from source areas may be transported by the wind or storm runoff and deposited within downgradient floodplains, surface water, and riverbed/streambed sediment. Soils from the BOF Sludge Area and the Northern Slag Pile Area can travel downslope into the Shenango River floodplain and ultimately into the Shenango River. Soils from the Southern Slag Pile Area can travel downslope into the Ohio Street wetland area or into the wetland complex south of the pile, into the wetland ponds, into the unnamed tributary and ultimately into the Shenango River. Soils from the Southern Slag Pile Area also can travel downslope and into the western floodplain of the Shenango River and then into the Shenango River.

The analytical data generated in the RI revealed a spatial relationship between the nature of contaminants observed in the source areas and the distribution of these same contaminants in downgradient areas. In general, downgradient areas of floodplain soil associated with topographic depressions contained source-related contaminants at relatively high concentrations. Downgradient riverbed or streambed sediment depositional areas also contained source-related contaminants at relatively high concentrations. These observations suggest a high likelihood that contaminants from the source areas are moving downgradient into adjacent floodplains, wetlands, and surface waters.

3. Soil-to-Groundwater Migration

Based on the evaluation of Site characteristics and monitoring data, groundwater is one of the more important modes of transport for contaminants at the SSFW Site. During the field investigation, the sampling crew observed that water levels in the ponds south of the Southern Slag Pile Area would rise approximately 2 to 3 days after a steady rain. During periods of rainfall, water infiltrates the source areas containing contaminants and carries with it dissolved organic and inorganic constituents.

The potential for contaminants to move into groundwater from source material is dependent on several physical and chemical properties of the particular contaminants. The ability for a contaminant to move from soil into water is affected by the organic carbon-normalized partition coefficient (K_{oc}) for contaminants in the soil/slag. Contaminants with high K_{oc} are likely to strongly absorb to soil particles and will resist leaching into groundwater. These chemicals generally include SVOCs, PCBs, PAHs and pesticides. Metals present as their soluble salts can dissolve in percolating precipitation and can contaminate the groundwater; metals present as insoluble minerals will be more resistant to migration in dissolved form. Contaminant migration is also expected to be slower than groundwater flow due to retardation as a result of adsorption to soil particles. Retardation may be negligible for the highly mobile constituents (such as the metals) and significant for the relatively immobile compounds (such as large, hydrophobic organic contaminants). Constituents also disperse laterally as they are transported downgradient and are diluted by adjacent, uncontaminated groundwater.

The analytical data for groundwater in the unconfined aquifers below the source areas (the surface and glacial till aquifers) indicated significantly high levels of the same metals detected in the source areas. In some areas, PAHs were detected in both source area soils and in underlying groundwater. The grain size and total organic carbon data provide an additional line of evidence that migration from soil-to-groundwater occurs rapidly at the Site. These observations indicate a high likelihood that contaminants from the source areas are leaching into groundwater in the unconfined aquifer.

4. Groundwater-to-Surface Water Migration

Based on the hydrogeologic assessment conducted in the RI, groundwater in the unconfined aquifers at the SSFW Site (the surficial and the glacial till) generally flows to the east and southeast and discharges into adjacent surface water bodies. At the BOF Sludge and the Northern Slag Disposal Areas, groundwater flow in these surface aquifers discharges into the Shenango River. At the Southern Slag Disposal Area, groundwater flow in the surficial aquifers discharges into the wetland/pond complex, the unnamed tributary, and the Shenango River. Ultimately, all groundwater that interacts with source area material will discharge into the Shenango River.

The concentrations of Site-related constituents in the groundwater are significant at the source areas; however, as groundwater migrates toward distant surface discharge points, concentrations generally decrease due to retardation, adsorption, and dilution. Groundwater is expected to flow downward from the surficial aquifer into the glacial till as evidenced by the generally consistent concentrations of Site related metals in both aquifers. Glacial sediments on-Site are extensive enough to produce a confining bed above the gravel zone and underlying bedrock and create artesian conditions. However, concentrations of most detected constituents in the gravel and bedrock aquifers, below and downgradient of the source areas, are generally consistent with regional background levels. In addition, the concentrations of these constituents decrease with depth. These observations, and the observation of artesian conditions in portions of the confined aquifer (indicating upward flow from the deeper aquifers into the shallow aquifers and the Shenango River), suggest that there is no substantial downward flow into the deeper confined aquifers.

5. Biotic Migration

Contaminant migration through biological organisms may occur through direct exposure to contaminated media, **bioaccumulation** through ingestion of contaminated media, and food-chain transfer from prey to predator. Bioaccumulative contaminants from this list detected in media at the SSFW Site include: arsenic, cadmium, chromium (as hexavalent chromium), copper, lead, mercury (as methyl mercury), nickel, silver, zinc, PAHs, pesticides, PCBs (Aroclors), and dioxin/furans.

6. Soil-to-Air Migration

Fine-grained material from source areas may be transported by the wind and released to the atmosphere. Constituents bound to surface soils may be transported as low-density or small diameter particulates and dust, which are suspended by wind energy, then blown to downwind locations. Although some portions of the source areas are covered with vegetation, most of the material at the source areas has little or no cover. Dust formation, and therefore soil-to-air migration of contaminants, may be significant during extended periods of dry weather.

An air dispersion model is a computer model used to study and predict the transport of air and pollutants in the air. Air dispersion modeling was conducted as part of the RI and the associated human health risk assessment (MACTEC, 2004) to calculate the concentration of non-volatile and semi-volatile contaminants in the air due to the surface soil contamination of the Site. The results of the air modeling analysis are presented in the *Air Dispersion Modeling Analysis and Identification of Chemicals of Potential Concern for Inhalation Exposure* report (Phase 1 and Phase 2; MACTEC, 2004). Contaminant concentrations in air were predicted using EPA's air dispersion model, Industrial Source Complex Short Term version 3 (ISCST3) with Site-specific assumptions regarding emissions of the erodible surface material of the Site.

Seven on-Site exposure areas were identified: the Northern Slag Pile, the BOF Sludge Area, the Southern Slag Area, the Shenango River Floodplain, the Unnamed Tributary Floodplain, the Southeast Floodplain, and the Ohio Street Wetlands. Four potential exposure areas located beyond the property boundaries also were identified: the State Line Residential Area, the Wansack Residential Area, the Ohio Street Industrial Area, and the Farrell Residential Area. A fifth potential exposure area was identified for areas not encompassed by any of the other exposure zones.

Details of the constituents and predicted air concentrations for all areas are presented in the Phase 2 report (see Appendix H of the RI report; Black and Veatch). Dust-borne contaminants of concern include PAHs, pesticides, PCBs, total 2,3,7,8-tetrachlorodibenzodioxin (TCDD) toxic equivalent quotient (TEQ) and inorganic contaminants. The surface soils at the SSFW have experienced long-term natural weathering and very likely have lost the bulk of volatile constituents as a result of volatilization, leaching to groundwater, and/or runoff to surface water. Therefore, air transport of volatile organics likely is not an important migration process at the Site. The locations of the highest concentrations varied among the constituents; however, the model estimated that the highest dust-borne contaminant concentrations would be located within the boundaries of the three source areas (Northern Slag Pile, BOF Sludge Area, Southern Slag Area) and would decrease rapidly with distance from the sources. This air modeling indicated that there is a potential for dust-borne contamination from the source areas to move from the Site to adjacent areas, primarily toward the east-northeast. However, the distribution of dust-borne contaminants at levels of concern is generally limited to areas within 500 feet of the Site.

C. Conceptual Site Models

A Conceptual Site Model was developed to identify which human exposure pathways were complete or could be potentially complete in the future. The following discussion identifies complete pathways for potential on-Site and off-Site receptors as identified in the Conceptual Site Model.

The primary sources of Site-related contamination are the slag and sludge from the Northern and Southern Areas which were placed during the operation of the former Sharon Steel Plant. Site-related contaminants are released by leaching from slag and sludge to groundwater and by erosion combined with overland runoff into the Shenango River. Groundwater contamination impacts the shallow aquifer on Site, and as a secondary source, impacts surface water and sediments, which in turn affect bio-uptake in certain plants and animals on Site. Erosion of slag and sludge and overland runoff also contribute contamination to surface water and sediments and wind erosion of slag and sludge will release contamination into the air.

The ecological Conceptual Site Model predicts relationships between stressors and ecological entities. It evaluates contaminants, potential ecological receptors and exposure pathways. The immediate exposure medium to ecological receptors is slag and sludge waste and contaminated soils where plants, vertebrates and invertebrates in floodplain habitats and wetlands habitats have been exposed by direct contact. Contaminants have also migrated via groundwater or overland transport to surface water and sediments, exposing aquatic receptors to contaminants transported to aquatic environments.

VI. CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

The Northern and Southern portions of the Site are currently located within an industrial area. The Northern Area is approximately sixty one acres and includes those portions of the Site which are north of Ohio Street. The Northern portion of the Site includes an asphalt plant property: a twenty seven acre area which includes an eight acre work area under the asphalt plant and a six acre property owned by a trucking company currently used as a garage and truck storage area. The Southern Slag pile consists of approximately two hundred and thirty one acres and includes those areas south of Ohio Street; the Southern Slag Pile which is currently being mined by a prospective purchaser party (231 acres), and the wetlands/*floodplain* located between the slag piles and the Shenango River (to the east) and the unnamed tributary (to the south) (see Figure 2). The Prospective Purchaser Party operates an active slag mining operation on the Southern portion of the Site permitted by Pennsylvania Department of Environmental Protection (PADEP) and authorized by EPA pursuant to the Prospective Purchasers Agreement (PPA). The Prospective Purchaser Party will reduce the volume of contaminated waste slag at the Site by continuing to mine and remove slag from the Southern Area. Mining is expected to remove over 3 million cubic yards of slag from the Site, which is beneficially reused to make road aggregate. However, due to technical limitations (groundwater dewatering) and cost/benefit considerations, the Prospective Purchaser Party will not remove the last four feet of slag. This will leave four feet of slag over the original native soil in the Southern Area.

Approximately 40 homes are within 1 mile of the Site. Most of these residences receive their drinking water from domestic groundwater wells screened in the confined or bedrock aquifers. These residences are all located upgradient of the Site (with respect to topography and groundwater flow) and are primarily located along State Line Road, Chestnut Ridge Road (in Ohio), and Wansack Road (in Pennsylvania). The majority of the residences in Mercer County receive their drinking water from treated surface water obtained from the Shenango River system by Aqua America (formerly the Shenango Valley Water Company [SVWC]). Aqua America provides water for these residents from two surface water intakes along the Shenango River. The first is located approximately 3.5 miles upstream of the Site and the other is located approximately 18 miles downstream. The water (from the Shenango River) is treated by Aqua America at a processing plant near the Shenango Reservoir. Along with the Aqua America supply and the domestic wells, the Hubbard Water Company (HWC), also provides potable water for residents outside the Aqua America service area. Until the 1990's the HWC obtained water from a series of wells near the city. The nearest HWC supply well is located 3.1 miles southwest of the Site. In late 1994, the HWC discontinued the use of these wells for potable water and began wholesale purchasing of water from Aqua America. The HWC has a 20-year contract to purchase potable water from Aqua America. At the present time, the HWC purchases nearly 1,300,000 gallons of water per day. The Shenango River itself is used as a source of potable water for the City of Sharon and for recreational fishing and boating.

In both the public official briefing and public meeting for the proposed plan, EPA solicited the publics' and local officials' preference for future use of the Site. There was interest from the officials and the public to put in a road through the Site for access from Pennsylvania to Ohio. Other possibilities for use of the Site included open space and developing industrial facilities on the Site.

VII. SUMMARY OF SITE RISKS

A. Human Health and Ecological Risk Assessment Summary

As part of the RI/FS, EPA conducted a baseline risk assessment to determine the current and future effects of contaminants on human health and the environment. A baseline risk assessment estimates the "baseline risk." That is, what risks the Site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. Risks to human health and the environment were determined in Baseline Human Health and Ecological Risk Assessments. The Response Action selected in this Record of Decision is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

Human Health Risk Assessment Summary
The Human Health Risk Assessment studies the ***carcinogenic*** and non-carcinogenic risks to people exposed to contaminants at the Site. A summary of potential risks to human health from exposure to contamination at SSFW are shown in Table 1. A four-step process was used to estimate the baseline human health risks at the Site:

Identification of Chemicals of Concern ("COCs")

In Step 1, EPA reviews the concentrations of contaminants found at a Site as well as past scientific studies on the effects these contaminants have had on people (or animals as a substitute when no human studies are available). Comparisons between Site-specific concentrations and concentrations reported in past studies enable EPA to determine which contaminants are most likely to pose the greatest threat to human health.

EPA identifies "chemicals of potential concern" (COPCs), which are the chemicals that exceed screening levels and therefore receive a detailed quantitative analysis in the risk assessment. For the SSFW Site, more than 40 COPCs were identified (Table 2-1 of the Human Health Baseline Risk Assessment). Of the COPCs, only a subset, the "chemicals of concern" (COCs), serves as the focus of the remedy. When the COCs are addressed, then risk will fall into the acceptable range.

At the SSFW Site, COCs were identified in samples of soil/slag, groundwater, surface water, and sediment. Table 1 lists the COCs for each Exposure Point/Media evaluated at the Site. The COCs for soil and dust are primarily metals. The COCs for groundwater are metals and vinyl chloride and the COCs for the Shenango river sediment are PAHs.

Exposure Assessment

In Step 2, the Exposure Assessment, EPA considers the different ways that people might be exposed to the COCs identified above, the concentrations that people may be exposed to, and the potential frequency and duration of exposure. The current and potential future land uses play a key role when EPA determines the exposure scenarios to be evaluated in the Human Health Risk Assessment.

The SSFW Site has historically been used for industrial purposes and is currently zoned for industrial use. However, since land use and zoning can change, a future residential scenario has been considered and will serve to justify restrictions on land and groundwater use in the future. The Human Health Risk Assessment evaluated the pathways which could lead to exposure for people, such as dust inhalation, use and/or drinking of well water, wading or swimming in the Shenango River and the wetland ponds, eating fish or waterfowl, and direct contact with or ingestion of the soil. Table 1 lists the possible human receptors for each media of concern. In summary, the possible human receptors include:

- Potential future residents living on the Site (children and adults),
- Residents currently living adjacent to the Site,
- Trespassers accessing the Site,
- Recreational users (fishing and hunting),
- Industrial workers , and
- Construction workers

Using this information, EPA calculates the "reasonable maximum exposure" (RME) scenario, which portrays the highest level of exposure that could reasonably be expected to occur.

Toxicity Assessment

In Step 3, the Toxicity Assessment, EPA uses the information from Exposure Assessment combined with information on the toxicity of each chemical to assess potential health risks. EPA considers two types of risk: cancer risk and non-cancer risk. The NCP, 40 ***Code of Federal Regulations*** (***CFR)*** Part 300, establishes a range of acceptable levels of carcinogenic risk for Superfund Sites that range between one in 10,000[1] and one in 1 million additional cancer cases if clean-up action is not taken at a Site. In addition to carcinogenic risk, chemical contaminants that are ingested, inhaled or absorbed through the skin may present non-carcinogenic risks to different organs of the human body. The non-carcinogenic risks or toxic effects are expressed as a Hazard Index (HI). EPA considers a HI exceeding one (1) to be an unacceptable non-carcinogenic risk.

Risk Characterization

In Step 4, the Risk Characterization, EPA determines whether the calculated risks for the Site are within the acceptable risk range of 1×10^{-4} to 1×10^{-6}, or an HI > 1. The results of the three previous steps are combined, evaluated and summarized. EPA adds up the potential risks from the individual contaminants and exposure ***pathways*** and calculates a total Site risk.

a) Groundwater

Residential Wells

Data (See Table 1 and Figure 5) from existing residential wells indicates a potential cancer risk associated with arsenic, and a non-cancer hazard associated with both arsenic and thallium. However, these residential wells are located upgradient of the Site. Groundwater impacted by the Site is located downgradient and flows to the east towards the Shenango River where it ultimately discharges. In addition, the residential wells are *screened* in the two lowermost gravel or bedrock aquifers while the majority of contamination at the Site is found primarily in the shallow two uppermost aquifers.
1

Therefore, EPA believes the calculated risks associated with arsenic and thallium are related to high natural concentrations of these metals in the gravel/bedrock aquifer throughout the region. The residents using these wells have been notified and provided literature on how they might prevent exposure to the naturally occurring metals.

Site Groundwater

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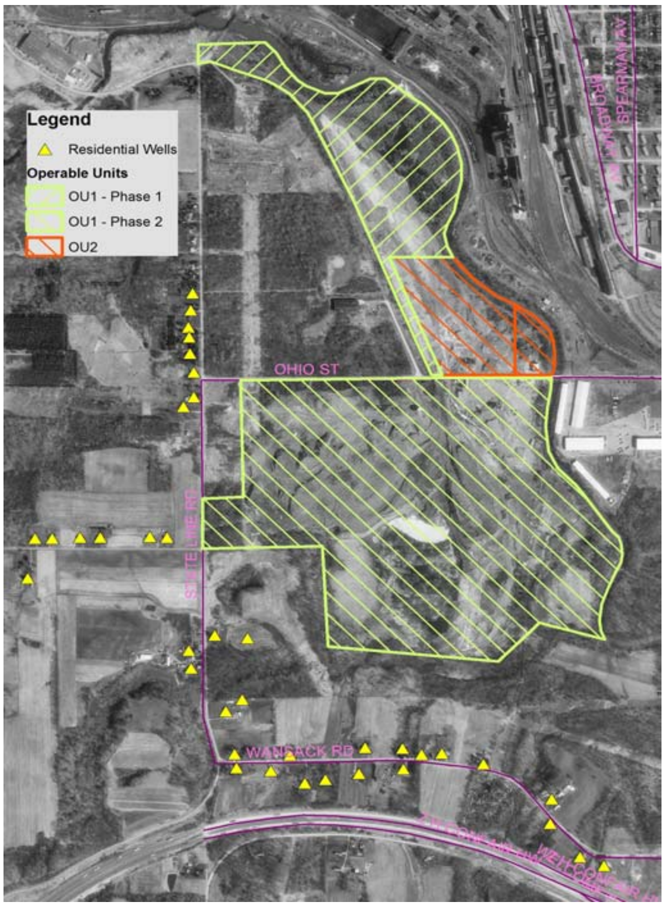
1 1 In other words, for every 10,000 people exposed, one extra cancer *may* occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes.

Groundwater at the Site is contaminated above drinking water standards. However, there are no current users of contaminated groundwater at the Site. As previously stated, the shallow groundwater impacted by the Site flows towards the Shenango River or the emergent wetland/unnamed tributary where it ultimately discharges. However, the groundwater data (See Table 1) indicate a potential unacceptable cancer risk associated with the use of shallow or glacial till groundwater as a future drinking water supply. The cancer risk is associated with arsenic and vinyl chloride. Non-cancer hazards above the level of concern are associated with exposure to various metals and vinyl chloride.



Data from the deeper gravel zone aquifer indicate a non-cancer hazard associated with barium and thallium and data from the deepest zone, the bedrock aquifer indicate a potential risk associated with arsenic. However, the arsenic in the bedrock aquifer is associated with background conditions.

The shallow groundwater at the Site contains the most elevated levels of metals and organic chemicals from Site contamination. The deeper groundwater contained elevated levels of barium and thallium at the Site.

Figure 5: Residential Wells Samples in the Vicinity

In summary, the risk assessment indicates a potential health risk if contaminated groundwater at the Site from the shallow or gravel aquifers were to be used as a future drinking water supply.

b) **<u>Site Soil and Dust</u>**

Soil and dust have been evaluated at the following locations: Northern and Southern Slag disposal areas, BOF Sludge area, three floodplain areas, and the Ohio Street wetlands.

Contaminant concentrations in air/dust were predicted using EPA's air dispersion model, Industrial Source Complex Short Term version 3 (ISCST3), with Site-specific assumptions regarding emissions of the erodible surface material of the Site.

Cancer Risk – Data (See Table 1) from the BOF Sludge area, Shenango and unnamed tributary, floodplain soils, and the Ohio Street Wetlands indicate a potential unacceptable cancer risk associated with exposure to soils and dust.

The areas/exposure pathways driving the risk are:

1. Potential inhalation of dust containing chromium (as Cr^{+6}) from the BOF Sludge Area. (future resident and industrial worker)

2. Exposure to soil and dust in the Shenango River floodplain soils exceed the acceptable risk range due to potential ingestion and dermal absorption of benzo(a)pyrene in soil (future resident). Exposure to soil and dust in unnamed tributary floodplain soils exceed the acceptable risk range due to potential inhalation of chromium (as Cr+6) in dust. (future resident).

3. Exposure to soil and dust in the Ohio Street Wetland exceed the acceptable risk range due to potential inhalation of chromium (as Cr+6) in dust. (future resident and industrial worker)

Non-cancer Hazard (Chronic) – Data (See Table 1) from the Slag disposal areas, BOF Sludge area, Floodplain soils, and the Ohio Street Wetlands indicate a potential unacceptable non-cancer hazard associated with long-term exposure to soils and dust for all receptors evaluated. The hazards are associated with potential inhalation and dermal absorption of various metals present onsite; the specific chemicals are listed in Table 1.

Non-cancer Hazard (Acute) – Potential short-term or acute effects (short term) are associated with the inhalation of dust contaminated with arsenic, barium, nickel and vanadium.

Lead - Lead is evaluated not by a cancer risk or a non-cancer ***HI,*** but by a model that predicts potential blood-lead levels. Lead in the BOF waste sludge would be associated with potentially unacceptable blood-lead levels in children, if they accessed the Site or if the soil was used by residents.

Background - The presence of the following metals in soils at the site can be attributed to levels found in soils (See Table 1) regionally:

- Aluminum (in BOF and Southern surface soil/slag, the Shenango River floodplain, the Unnamed Tributary Floodplain, the Southeast Floodplain and the Ohio Street Wetlands).
- Arsenic (in Southern surface soil/slag, the Shenango River Floodplain, the Southeast Floodplain and the Ohio Street Wetlands).
- Barium (in the Shenango River Floodplain, Unnamed Tributary Floodplain,

Southeast Floodplain, and Ohio Street Wetlands).

- Chromium (in the Unnamed Tributary Floodplain).
- Manganese (in the Unnamed Tributary Floodplain, Southeast Floodplain, and Ohio Street wetlands)
- Vanadium (in the Southeast Floodplain)

c. <u>Off Property - Dust</u>

In addition to the seven on-Site areas evaluated for exposure to dust, four potential exposure areas located beyond the property boundaries were also identified: the State Line Residential Area, the Wansack Residential Area, the Ohio Street Industrial Area, and the Farrell Residential Area. Air dispersion modeling in the RI has indicated that dust from the Site may produce a potential unacceptable cancer risk or non-cancer hazard in the following areas (See Table 1):

State Line Residential Area: Child Resident due to long-term inhalation of dust contaminated with manganese; concerns for potential acute exposure to nickel and vanadium.

Wansack Residential Area; Child Resident due to long-term inhalation of dust contaminated with manganese; concerns for potential acute exposure to nickel, and vanadium.

Ohio Street Industrial Area: Future residential cancer risk from long-term inhalation of dust containing chromium; industrial and construction workers and residential non-cancer hazards from long-term inhalation of dust containing chromium, manganese; concerns for potential acute exposure to dust contaminated with arsenic, barium, nickel, and vanadium.

Farrell Residential Area: Construction workers, adult and child resident due to long-term inhalation of dust contaminated with manganese; concerns for potential exposure to nickel, and vanadium.

For all four residential areas, the results of the analysis suggest that there may be a concern for potential non-cancer effects for the resident on the central nervous system associated with concentrations of manganese modeled in dust. Although the HQs associated with manganese exceed unity, the presence of this metal may in part be a regional (background) condition. The details of the Human Health Risk Assessment for the residential areas can be found in *Sharon Steel Farrell Works, Baseline Human Health Risk Assessment Report* (June 2005).

EPA consulted with ATSDR to determine whether the exceedance of acute screening levels posed a short-term public health hazard from dust inhalation to nearby off-Site workers and/or residents. ATSDR concluded that the conditions that would produce unacceptable acute risks would be rare and unlikely (e.g., winds so intense that visibility would be impaired, as in a dust storm). ATSDR also recommended dust-suppression techniques during remedial activities and that air sampling could be warranted if significant dust migration were to occur.

d. <u>Surface Water and Sediment</u>

The surface water and sediment are associated with several aquatic habitats at the Site: the Shenango River, the wetland pond complex and the unnamed tributrary. The Shenango River supports a variety of wildlife and fish and is used by people for recreational fishing. In addition, the Shenango River is used as a source of drinking water by various water companies in the area. There are no unacceptable current risks to people who may come in contact with the surface water associated with the Shenango River. Benzo(a)pyrene and dibenzo(a,h)anthracene in river sediment were chemicals of concern to industrial workers potentially exposed to river sediment.

For people who might eat fish from the Shenango River, unacceptable concentrations of PCBs, dioxins, thallium, and mercury were found in fish tissue. However, of these, only mercury was found to be Site related. Thallium was also found in fish from the Unnamed Tributary and Slag Pond at unacceptable concentrations that could not be attributed to background at the time of the Remedial Investigation (See Table 1).

Summary of Ecological Risk Assessment

Like a Human Health Risk Assessment, an Ecological Risk Assessment (ERA) serves to evaluate the potential for risks due to exposure to Site contaminants specific to ecological receptors (such as wildlife, fish, and plants). Since the ERA evaluates many species that have drastically different exposure pathways, the ERA can appear complicated. Numerous environmental processes and ecological receptor groups (part of which are referred to as "assessment endpoints") are evaluated, and there are differences in contaminant exposures and sensitivity to contaminants between groups. For example, wildlife are mainly exposed through their diet while soil organisms are exposed through direct contact with the soil in which they live. The complexity of the ERA arises from the need to evaluate the important exposure pathways to the relevant receptors. The toxicology varies between the different ecological groups. In addition, some contaminants are effectively transferred through the food chain, bioconcentrating and ultimately posing risks, while other contaminants are not transferred because they are metabolized, biologically regulated or simply not absorbed.

Superfund Site-specific ERAs are conducted using an eight-step process which minimally consists of two tiers of evaluation: a Screening Level ERA ("SLERA" - steps 1 and 2) and the Baseline ERA ("BERA" - steps 3 through 7). Step 8 is a risk management step. The function of the SLERA is to determine if a BERA is necessary, along with which contaminants should be evaluated further. A SLERA uses published conservative toxicity benchmarks found in literature for water, sediment and soil, and compares Site concentrations to these benchmarks.

The BERA begins with the results of the SLERA and with problem formulation, which establishes the goals, breadth and focus of the investigation. It also establishes the assessment endpoints, which are the "explicit expressions of the ecological values to be protected." The assessment endpoints can also be viewed as the adverse effect(s) that the contaminant(s) from a

Site may have on ecological receptors or communities that should be addressed by remedial actions at a Site. The questions and issues to be addressed in the BERA are defined based on potentially complete exposure pathways and ecological effects. A conceptual Site model (CSM) is developed that includes questions about the assessment endpoints and the relationship between exposure and effects. The CSM describes the approach, types of data and analytical tools to be used for the analysis phase of the BERA. Information is generated through literature reviews and field studies, results are compiled and conclusions are reached. Once it has been concluded that ecological risk exists, the information is used to meet other objectives, such as determining what exposure level may minimize any unacceptable risk.

A CSM relies on contaminant and habitat characteristics to identify critical exposure pathways to the selected measurement endpoints. Measurement endpoint may include measurable biological responses to a stressor that can be related to the assessment endpoint. The CSM for the Sharon Steel Farrell Works Site, for example, would illustrate that the primary sources of chemical contaminants are the slag piles and the BOF sludge pile. Contaminants originate from the northern and southern slag piles and the BOF sludge pile which migrate to the various habitat types (upland, wetland, and open water) through wind erosion, runoff, infiltration and deposition, where soil and benthic invertebrates, fish and other organisms may be exposed. The potential risk exists where organisms are exposed to contamination directly (e.g., benthic invertebrates living in contact with contaminated sediments, fish contacting contaminated sediments/surface water and/or earthworms and other burrowing organisms living in contact with soil), as well as when organisms higher in the food chain consume organisms lower in the food chain that have been in contact with contamination and stored contamination in their bodies (e.g., benthic invertebrates may store contaminants, then a spotted sandpiper eats the invertebrates). In general, the SLERA identified PAHs, PCBs and inorganic compounds exceeding benchmarks in sediment, soil and water.

At the Sharon Steel Site, a total of 15 assessment endpoints were evaluated, five related to direct exposure, three related to bioaccumulation of contaminants in tissue and seven related to exposure to contamination through the food chain for both terrestrial and aquatic receptors. Of the 15 assessment endpoints evaluated, only six (endpoints: 1, 2, 10, 9, 4, and 12) were determined to be at potential risk from Site related contaminants (see Table 2). Four of these assessment endpoints are based on the comparison of Site-specific media data (soil, sediment, and surface water) to ecologically-relevant benchmarks (protective of plants, soil invertebrates, aquatic communities, and benthic invertebrates), representing direct exposure pathways. The remaining two assessment endpoints (terrestrial vermivore and benthivore) are based upon food chain consumption of soil invertebrates and benthic invertebrates respectively.

In general, soil exposure pathways of concern for assessment endpoint 1 (protection of plant communities) and assessment endpoint 2 (protection of soil invertebrate communities) were identified for the following habitats: shrub-scrub, forested riverine floodplain – Shenango River; shrub-sapling floodplain; forested riverine floodplain – Unnamed Tributary (assessment endpoint 1 only). Chemicals of concern for these habitats included several inorganic compounds , total PAHs, and endrin metabolites.

Sediments exposure pathways of concern for assessment endpoint 10 (protection of benthic invertebrate communities) were identified for the following habitats: palustrine emergent wetland; wetland pond habitats; and both open water habitats – Unnamed Tributary and Shenango River. Chemicals of concern for these habitats included inorganic compounds, several individual PAHs, some SVOCs, PCBs, and pesticides.

Surface water exposure pathways of concern for assessment endpoint 9 (protection of aquatic communities) were identified for the following habitats: small wetland and slag pond habitats; and both open water habitats – Unnamed Tributary and Shenango River. Chemicals of concern for these habitats include several inorganic compounds.

Assessment endpoint 4 (protection of vermivores) is based upon Site-specific bioaccumulation earthworm studies to estimate the chemical concentration in earthworm tissue. The estimated tissue concentration is then used in the exposure model for the short-tailed shrew and American robin. Exposure pathways of concern were identified in the following habitats: shrub-scrub; forested riverine floodplain – Shenango River; shrub-sapling floodplain; forested riverine floodplain – Unnamed Tributary; and shrub-scrub palustrine wetland. Chemicals of concern for these habitats included inorganic compounds, several individual PAHs, and dioxins/furans.

Assessment endpoint 12 (protection of benthivores) is based upon estimated benthic invertebrate tissue concentrations. A sediment to invertebrate biotransfer factor (BTF) was used to estimate chemical concentration levels in benthic invertebrates. This value was then used in the exposure model for the spotted sandpiper. Exposure pathways of concern were identified in the following habitats: palustrine emergent wetland; wetland pond habitats; and both open water habitats – Unnamed Tributary and Shenango River. Chemicals of concern for these habitats include inorganic compounds, SVOCs, individual PAHs, and some pesticides.

The habitat-specific results are provided below.

<u>Northern and Southern Slag Piles and BOF Sludge Area</u>

Although not evaluated in the BERA because it is not considered a viable habitat, it has been determined that the slag piles are, or have been, the primary source of contamination in adjacent habitats. The piles and sludge are relatively barren because of the physical and chemical nature of the slag. Because of the nature of these wastes, little to no soil is available for plant communities to become established. Where soil does exist on the piles, the chemical contamination associated with the slag or sludge, often prohibits the establishment of any plant community. Therefore, remediation of the slag piles and sludge area have become the primary focus of the FS and subsequent investigations.

<u>Shrub-Scrub Upland Habitat</u>

In the shrub-scrub upland habitat the plant community is likely adversely impacted by direct exposure to metals, PAHs, and dioxins. The BOF Sludge Area is located within this habitat. Beyond the sludge area, no overt visible signs of plant toxicity were observed. However, plants species which had recolonized this area are likely to be resistant to the contaminants in the surface soil. The soil invertebrate population is likely adversely impacted by metals in surface soils. Finally, the **vermivores** are likely impacted by food-chain exposure to metals from surface soils. Metals appear to be the key risk drivers in the shrub-scrub upland habitat.

Forested Riverine Floodplain Habitat – Shenango River

In the forested riverine floodplain habitat, the plant community does not appear to be adversely impacted by physical or chemical stressors. Metals, PAHs, and pesticides are present in surface soils from all areas of this habitat at levels that present a direct exposure risk to soil invertebrates and food chain exposure risk to vermivore communities. Repeated, unsuccessful efforts to collect earthworm samples indicate that the soil invertebrate community is meager. Metals appear to be the key risk drivers in the forested riverine floodplain habitat.

Shrub-Sapling Floodplain Habitat

In the shrub-sapling floodplain habitat (located southeast of the Southern Slag Pile), metals, PAHs, and endrin metabolites in surface soil present an ecological risk. Plant communities are at risk from direct exposure to metals and endrin metabolites in soil. Soil invertebrate communities are at risk from total PAHs in surface soil. Vermivores are at risk from food chain transfer of arsenic, mercury, and selenium in surface soil. Metals appear to be the key risk drivers in the shrub-sapling floodplain habitat.

Forested Riverine Floodplain Habitat – Unnamed Tributary

Based on the endpoints for the forested riverine floodplain habitat of the unnamed tributary, metals in surface soil may result in unacceptable ecological risk. Plant communities are at risk from metals in surface soil through direct exposure. Vermivores are at risk from food chain transfer of metals from surface soil. Metals appear to be the key risk drivers in the forested riverine floodplain habitat.

Shrub-Sapling Palustrine Wetland Habitat

No unacceptable ecological risks were associated with constituents detected in the soils of the shrub-sapling palustrine wetland habitat (the wetland area south of Ohio Street).

Palustrine Emergent Wetland Habitat

Contaminants in sediment of the palustrine emergent wetlands contain metals at levels that present a direct exposure risk to **benthic invertebrate** communities. In addition, metals in the sediments also present a risk to **benthivores** in the palustrine emergent wetland habitat. These risks are primarily driven by levels of arsenic and zinc in sediments from this habitat. Samples containing arsenic and zinc at levels of concern also contain the other COPEC.

Open Water/Pond Habitat

Potential ecological risk associated with open water/ponds habitats were evaluated separately. In general, iron in surface water is only a contaminant of concern in some of the smaller slag ponds throughout the Site. Contaminants in sediment of the palustrine emergent wetlands include metals and total 2,3,7,8-TCDD TEQs at levels that present a direct exposure risk to benthic invertebrate and food-chain exposure risk to benthivore communities. Most samples containing zinc at levels of concern contain the other chemicals of concern as well; therefore, zinc appears to be the principle driver for risks in this habitat. It should be noted that no wildlife were observed in one of the small open water ponds during any of the previous Site investigations. The lack of wildlife in this area is more likely to be related to high [alkaline] pH, small/fine grain size, and low dissolved oxygen than COC toxicity.

Shenango River Habitat
Copper presents a risk to aquatic communities in surface water only at two disparate locations. One location (SW26) is located adjacent to the Site. The second location (SW08) is located approximately 1 km downstream of the Site. Copper in groundwater could migrate from the Site into the Shenango River. Contaminants in sediment from the Shenango River contain metals, PAHs, and pesticides at levels that present a direct exposure risk to benthic invertebrates. In addition, these same contaminants also present a food-chain exposure risk to benthivores. The principal COCs are PAHs and zinc. The areas with the most significant PAH concentrations are located on the upstream edge of the BOF Sludge Area and at the confluence of the unnamed tributary with the Shenango River. Based on the river morphology, the locations near the BOF Sludge Area, where deposited sludge materials form part of the river bank, are likely to erode when the Shenango River experiences storm flow conditions.

Unnamed Tributary Habitat
Aluminum is a COC in surface water at two disparate locations and is not likely to be a widespread contaminant in surface water. Iron was detected at significant levels in every surface water sample from the unnamed tributary; therefore, it is likely to present a risk to aquatic communities. Iron was detected in groundwater samples from monitoring wells in the surficial groundwater and was also detected in the soils/wastes of the Southern Slag Pile Are, the nearest source. Sediment contained acetone, SVOCs, PCBs, barium, beryllium, and thallium at levels that present a direct exposure risk to benthic invertebrate communities in the tributary. Arsenic, chromium, lead, and selenium were present in sediment at levels that present a risk through direct and food chain exposure to benthic invertebrate communities and benthivores, respectively. Zinc was detected at levels in sediment that presents a risk through food chain exposure.

Summary of Site- Related Ecological Risk

In summary, the evaluation of the assessment endpoints for each habitat of concern at the SSFW indicated that all habitats contained contaminated media that present a risk to ecological communities. The primary sources of the contaminants are the Northern and Southern Slag Piles and the BOF Sludge Area.

VIII. REMEDIAL ACTION OBJECTIVES

The ***remedial action objectives*** (**RAOs**) describe the goals, or objectives for Site clean-up as set forth in the Proposed Plan. The RAOs for the Site are as follows:

- Prevention of human exposure to contaminated slag, soils, river sediment, and dust
- Prevention of human exposure to contaminated groundwater by implementing Institutional Controls
- Reduction of future migration of chemicals into groundwater so that the aquifer can be restored to its beneficial use.
- Reduction of surface runoff and groundwater discharge to prevent further migration of waste materials and contaminants of concern into the wetlands, the Shenango River and fish tissue.

IX. SUMMARY OF REMEDIAL ACTION ALTERNATIVES

Summary of Alternatives

During the Feasibility Study, various alternatives were evaluated to determine the best clean-up method to: 1) prevent inhalation of and dermal contact with waste slag and contaminated soils, sediment and dust; 2) prevent exposure to groundwater; 3) reduce migrations of contaminates to groundwater; and, 4) address contaminated sediments in the Shenango River, wetland/pond habitat, and the unnamed tributary. This evaluation was based on the information gathered during the RI. EPA's preferred alternative is ***Alternative 4 – Biosolid-Enhanced Cap and Passive Vegetated Groundwater Barrier with Institutional Controls and Long-Term Groundwater, Surface Water and Sediment Monitoring.***

Several alternatives evaluated in the FS did not meet the criterion of protecting human health and the environment; therefore, they are not discussed in detail in this Record of Decision. These alternatives were considered, but are not described here because they were not sufficient to achieve all the RAOs or were not implementable as discussed in the Feasibility Study. Further information can be obtained from the Administrative Record. These included:

- Alternative 2 – Institutional Controls.
- Alternative 5 – Source Removal, Media Excavation/Extraction, Treatment and Disposal.

Each remaining alternative, except the "no action" alternative, contains common elements that were considered in the evaluation process. The common elements include:

- Institutional Controls (ICs)
  - Groundwater use restrictions
  - Land use restrictions

- Protection of the Remedy

- Environmental monitoring with objectives determined in a Long Term Monitoring Plan
  - Groundwater
  - Surface water
  - Sediment
- Erosion protection to prevent the erosion of waste slag and sludge into the Shenango River and the wetland/pond area:
  - Streambank stabilization of the west bank of the Shenango River along its frontage with the SSFW Site.
  - Silt fencing will be anchored along the north perimeter of the wetland/pond habitat to prevent the inflow of eroded material from the adjacent slag piles into the wetland.
  - Enhance the vegetative buffer between the Site wetlands and off-site wetlands/pond to help further control potential migration of COCs in sediment.

The following section is a summary of the most significant clean-up alternatives that were considered during the Feasibility Study and their associated costs. The number of the alternatives is that which was used in the Feasibility Study.

Alternative 1 - No Action Alternative

Capital Cost*:*	$0
Annual Operation and Maintenance (O&M) Costs:	$0
Total O&M Costs:	$0
Total ***Present Worth Cost****:*	$0

Under this alternative, no remedial measures would be implemented at the Site to prevent exposure to the waste slag and sludge, contaminated soil and sediment, or groundwater contamination. The "no action" alternative is included because the NCP requires that a "no action" alternative be developed as a baseline for evaluating other remedial alternatives.

This alternative would not reduce human health and ecological risks to acceptable levels and would not meet ARARs.

Alternative 3a – Institutional Controls, Long-Term Monitoring, and a Geosynthetic Liner/Topsoil Cap

Capital Cost:	$51,267,215
Annual O&M Costs:	$68,946
Total O&M Costs:	$2,068,3803
Total Present Worth Cost:	$53,335,595

3 Includes annual costs for environmental monitoring based on quarterly sampling for 30 years.

This option uses a ¼-inch thick polypropylene/clay geosynthetic liner and 12-inch thick topsoil cover to cover the graded slag/sludge. In addition to covering the contaminated slag/sludge at the Site, this cover would prevent infiltration of precipitation into underlying groundwater which would ultimately reduce the discharge of contaminated groundwater into the Shenango River and the wetland/pond complex. As a result, this option would require significant area for stormwater management facilities and point discharges for stormwater from the Site into the river, ponds, and wetlands. This Alternative would eliminate migration of COCs. Continued migration of existing contaminated groundwater is allowed. Groundwater cleanup would eventually be attained because the source would be capped.

The liner/topsoil cover option will require significant ongoing maintenance to ensure the cap integrity. Disadvantages of this Alternative include the limited availability of sufficient quantities of topsoil needed for the large Site area.

Alternative 3b – Institutional Controls, Long-Term Monitoring, and a Clay/Topsoil Cap

Capital Cost:	$24,084,468
Annual O&M Costs:	$68,946
Total O&M Costs:	$2,068,380
Total Present Worth Cost:	$26,152,848

This option uses a 6-inch thick clay layer and a 12-inch thick topsoil cover to cover the graded slag/sludge. In addition to covering the contaminated slag/sludge at the Site, this cover would prevent infiltration of precipitation into underlying groundwater which would ultimately reduce the discharge of contaminated groundwater into the Shenango River and the wetland/pond complex. As a result, this option would require stormwater management facilities and point discharges for stormwater from the Site into the river, ponds, and wetlands. This Alternative would eliminate migration of COCs. Continued migration of existing contaminated groundwater is allowed. Groundwater cleanup would eventually be attained because the source would be capped.

The clay/topsoil cover option will require significant ongoing maintenance to ensure the cap integrity. Disadvantages of this Alternative include the limited availability of sufficient quantities of clay and topsoil needed for the large Site area.

Alternative 3c – Institutional Controls, Long-Term Monitoring, and a Portland Cement Cap

Capital Cost:	$64,844,799
Annual O&M Costs:	$67,260
Total O&M Costs:	$2,017,800
Total Present Worth Cost:	$66,862,599

This option applies Portland cement to the graded mass of slag and sludge to create a cemented crust of Site material that covers the underlying source material. In addition to covering the contaminated slag/sludge at the Site, this cover would prevent infiltration of precipitation into underlying groundwater which would ultimately reduce the discharge of contaminated groundwater into the Shenango River and the wetland/pond complex. As a result, this option would require stormwater management facilities and point discharges for stormwater from the Site into the river, ponds, and wetlands. This Alternative should eliminate existing migration of COCs. Continued migration of existing contaminated groundwater is allowed. Groundwater cleanup would eventually be attained because the source would be capped.

The Portland cement cover option will require minimal ongoing maintenance; however, it would not be possible to re-vegetate the Site in the short or long-term. Under this capping option, the Site would remain a cemented area in the long-term; however, this could provide long-term opportunities for industrial uses.

Alternative 4 – Biosolid-Enhanced Cap, Passive Vegetated Groundwater Barrier, Institutional Controls, and Long-Term Monitoring

Capital Cost:	$8,727,200
Annual O&M Costs:	$67,260
Total O&M Costs:	$2,017,800
Total Present Worth Cost:	$10,745,000

This option mixes Class A biosolid material from nearby municipalities into the top 3 to 4 feet of the graded mass of slag and sludge to create an enhanced soil that will cover the underlying source material. Biosolids have been demonstrated to reduce the bioavailability and toxicity of metals in contaminated soils and have been used successfully at other mine-related Sites throughout the United States. In addition to covering the contaminated slag/sludge at the Site, this Alternative would reduce infiltration of precipitation into the underlying groundwater, ultimately reduce the loading of contaminants from source materials into groundwater, and would reduce the discharge of contaminated groundwater into the Shenango River and the wetland/pond complex. As a result, this option would require less area for stormwater management facilities and point discharges for stormwater from the Site into the river, ponds, and wetlands.

The biosolid enhanced cover option will require minimal ongoing maintenance, will allow the Site to be planted with native species, and will facilitate natural re-colonization of native plant species to create a natural habitat at the Site. A ***benchscale treatability study*** has been conducted to determine the effectiveness of the biosolid cover on reducing bioavailability and toxicity of metals. Collectively the benchscale results of the biosolids amendment testing indicate that the use of ten percent biosolids is preferred over higher application rates. The use of biosolids amendments at the Sharon Steel Site will increase the growth and effectiveness of Site revegetation, which will reduce contaminant mobility through dust generation and surface runoff. Revegetation will also reduce contaminant exposure to receptors by reduction in direct contact with slag and/or sludge, and dietary exposure to metals, thereby reducing bioaccumulation.

The groundwater infiltration through the biosolid enhanced cover would be greater than other capping alternatives. Additionally, a passive groundwater barrier would be used to capture contaminated groundwater before it reaches the Shenango River. This passive vegetated groundwater barrier would include the planting of staggered lines of native poplar trees between the source areas and the Shenango River. Poplar trees can draw as much as 30 gallons of groundwater per day and placing these trees just above the Shenango River will allow the root systems of these trees to draw groundwater from the surface aquifers before it is discharged into the Shenango River. The poplar trees will reduce the volume of contaminated shallow groundwater being discharged into the Shenango River.

Alternative 6a – Institutional Controls, Long-Term Monitoring, Geosynthetic Liner/Topsoil Cap, Hot-Spot Removal and Disposal of Impacted Media, Pump/Treat Impacted Groundwater

Capital Cost:	$63,737,282
Annual O&M Costs:	$152,445
Total O&M Costs:	$4,573,338
Total Present Worth Cost:	$68,310,619

This alternative is the same as remedial alternative 3a except that it adds the pumping and treatment of contaminated groundwater and the removal of floodplain soils and sediment in downgradient areas.

Excavation of contaminated floodplain soil hot spots and contaminated sediment hot spots in the wetland would be accomplished using typical excavation machinery. Areas of significantly high concentration which drive the ecological risks in this area will be excavated to a depth of two feet, treated on Site to stabilize and demobilize the contaminants, loaded in trucks, and transported to a nearby municipal landfill for use as cover material. This will require the construction of access roads to the southeast floodplain.

Dredging of contaminated sediment hot spots in the Shenango River and the wetland ponds would be accomplished using suction dredging equipment. Areas of sediment which drive the ecological risks will be excavated to a depth of two feet, treated on Site to stabilize and demobilize the contaminants, loaded in trucks, and transported to a nearby landfill for use as cover material.

The groundwater pump and treat system would consist of the installation of extraction wells around the perimeter of the source areas where groundwater discharges. Due to the size of the Site and direction of groundwater flow, two areas of extraction wells (along the Shenango River and along the wetland/pond complex) would be required. Contaminated groundwater from these extraction wells would be pumped from the well into a collection system which would convey contaminated water to two treatment facilities (one in the north portion of the Site and one in the south). Each treatment facility would consist of a granular activated carbon unit (GAC), to remove organic contaminants, and an ion exchange unit (IE) to remove metals. The solid waste stream (sludge and brine) and spent treatment units would be transported off Site for disposal and the treated water would be piped to the Shenango River or the wetland/pond complex and discharged at the surface. Groundwater treatment demands would be expected to gradually decrease as the groundwater aquifer is lowered through pumping and the covers prevent further infiltration. A smaller amount of flow would be expected as groundwater flows through the Site from upgradient areas.

Alternative 6b – Institutional Controls, Long-Term Monitoring, Clay/Topsoil Cap, Hot-Spot Removal and Disposal of Impacted Media, Pump/Treat Impacted Groundwater

Capital Cost:	$36,554,535
Annual O&M Costs:	$152,445
Total O&M Costs:	$4,573,338
Total Present Worth Cost:	$41,127,872

This alternative is the same as remedial alternative 6a except that it uses a clay/topsoil cap. The details of the clay/liner cap are discussed under Alternative 3b.

Alternative 6c – Institutional Controls, Long-Term Monitoring, Portland Cement Cap, Hot-Spot Removal and Disposal of Impacted Media, Pump/Treat Impacted Groundwater

Capital Cost:	$77,134,866
Annual O&M Costs:	$150,759
Total O&M Costs:	$4,522,758
Total Present Worth Cost:	$81,837,624

This alternative is the same as remedial alternative 6a except that it uses a Portland cement cap. The details of the Portland cement cap are discussed under Alternative 3c.

Alternative 7 – Institutional Controls, Long-Term Monitoring, Biosolid Enhanced Cap, Groundwater Slurry Wall/Pump & Treatment System, and Sediment Armoring

Capital Cost:	$12,127,129
Annual O&M Costs:	$145,716
Total O&M Costs:	$4,371,487
Total Present Worth Cost:	$16,498,607

This alternative is similar to Alternative 4 except that an engineered, active groundwater barrier system is proposed in place of the passive vegetated groundwater barrier and sediment armoring is included.

The groundwater barrier would consist of 4,500 linear feet of a bentonite slurry wall between the source areas and the Shenango River to a depth of 15 feet to prevent shallow groundwater from flowing from the Site into the Shenango River. In addition, a pump and treatment system would remove and treat the contaminated groundwater before it is discharged to the Shenango River. The groundwater pump and treat system would consist of the installation of extraction wells around the perimeter of the source areas where groundwater discharges. Due to the size of the Site and direction of groundwater flow, one area of extraction wells would be required along the Shenango River. Contaminated groundwater from these extraction wells would be pumped from the well into a collection system which would convey contaminated water to a treatment facility. The treatment facility would consist of a granular activated carbon unit (GAC), to remove organic contaminants, and an ion exchange unit (IE) to remove metals. The solid waste stream (sludge and brine) and spent treatment units would be transported off Site for disposal and the treated water would be piped to the Shenango River and discharged at the surface. Groundwater treatment demands would be expected to gradually decrease as the groundwater aquifer is lowered through pumping and the biosolid cover reduces future infiltration.

The sediment armoring would consist of encapsulating sediment hot spots in the Shenango River and the unnamed tributary with an impermeable geosynthetic liner anchored to the stream bottom and covered with rip rap to prevent future erosion.

X. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In this section, EPA evaluated the alternatives in detail to determine which alternative would be the most effective in achieving the goals of CERCLA, and in particular, achieving the remedial action objectives established for the Site. EPA uses nine criteria to evaluate clean-up alternatives in order to select a remedy. Below is a description of each of the nine criteria set forth in the NCP, 40 CFR § 300.430(e)(9). These nine criteria can be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria.

Threshold Criteria:

1. *Overall Protection of Human Health and the Environment* addresses whether a remedy provides adequate protection to human health and the environment and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of environmental statutes, regulations, and/or whether there are grounds for invoking a waiver.

Primary Balancing Criteria:

3. *Long-term Effectiveness* refers to the ability of a remedy to maintain reliable protection of human health and the environment, over time, once clean-up goals are achieved.

4. *Reduction of Toxicity, Mobility, or Volume through Treatment* addresses the degree to which alternative treatments will reduce the toxicity, mobility, or volume of the contaminants

causing Site-related risks.

5. *Short-term Effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and environment that may be posed during the construction and implementation period.

6. *Implementability* addresses the level of technical and administrative difficulty associated with completing a remedy, including whether materials and services needed to implement a particular option are readily available.

7. *Cost* includes estimated capital (startup) costs, as well as operation and maintenance costs, and are usually combined and presented as the Total Net Present Worth Cost.

Modifying Criteria:

8. *State Acceptance* indicates whether, based on its review of supporting documents and the Proposed Plan, the State supports, opposes, or has no comment on the preferred alternative.

9. *Community Acceptance* will be assessed in the ROD following a review of public comments received on the Proposed Plan and supporting documents included in the Administrative Record.

Overall Protection of Human Health and the Environment
CERCLA requires that the selected remedial action be protective of human health and the environment. An alternative is protective if current and potential future risks associated with each exposure pathway at a Site are reduced to acceptable levels. An exposure pathway refers to the way in which a person or other living organism can come into contact with contaminants.

Alternative 1 does not protect human health or the environment to any greater extent than already protected; adverse risk from exposure to source material and contaminated media downgradient is not reduced or eliminated by this option. In fact, exposure and risk could increase over time due to continued migration of slag/sludge solids with storm water runoff and the percolation of infiltrated storm water through the source material to groundwater.

Alternatives 3, 4, 6, and 7, all are likely to provide protection of human health and the environment. The ICs proposed under all of these alternatives will address current and future groundwater usage. Covering the source material prevents exposure to the source material. The covering retains the source material in place to minimize migration (via erosion or dust), and minimizes the percolation of surface precipitation through the source material to shallow groundwater. Ecological risks may remain in downgradient habitats; however, it is believed that risks posed by habitat destruction that could occur through remediation in Alternative 6 and 7 outweighs the current risk and would not benefit the wetland and floodplain area. Source controls will prevent further destruction of the downgradient habitats.   Long term monitoring will be used to verify that the ecological risk has diminished.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121 (d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA Sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARS are waived under CERCLA section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility citing laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA Site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility citing laws that while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA Site address problems or situations sufficiently similar to those encountered at the CERCLA Site that their use is well suited to the particular Site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for an invoking waiver.

Any clean-up alternative selected by EPA must comply with all applicable or relevant and appropriate federal and state environmental requirements. *Applicable* requirements are those substantive environmental standards, requirements, criteria, or limitations ***promulgated*** under federal or state law that can be legally applied to the remedial action to be implemented at the Site. *Relevant and appropriate* requirements, while not being directly applicable, address problems or situations sufficiently similar to those encountered at the Site that their use is well-suited to the particular Site. EPA may waive an ARAR under certain conditions; however, EPA is not waiving any ARARs for this Site.

Several ARARs relating to actions occurring on the Site (Action-Specific ARARs), the location where remedial activities take place (Location-Specific ARARs), and human and environmental health related to the Site contaminants (Chemical-Specific ARARs) apply to the preferred alternative. These are more specifically set forth in Table 4.

The following are the key Chemical-Specific ARARs:

> The Federal Ambient Water Quality Criteria (AWQC) for chronic effects in the Shenango River will be relevant and appropriate to ensure ambient water quality

criteria which deal with fish ingestion and protection of aquatic life are relevant and appropriate to the Shenango River.

The Federal Maximum Contaminant Levels (MCLs) and/or Maximum Contaminant Level Goals (MCLGs) for drinking water established under the Safe Drinking Water Act 42 U.S.C. §§300g-l will be relevant and appropriate to ensure that the migration of Site-related contamination in groundwater discharge is within acceptable limits for human consumption. These MCLs and MCLGs will also apply to groundwater as ARARs for restoration of the surficial aquifers at the Site.

The following are the key Action-Specific ARARs:

Federal Ambient Water Quality Criteria for the Protection of Aquatic Life 33 U.S.C. § 1314 is relevant and appropriate because the designated uses for the Shenango River at the Site include fishing and protection of aquatic life. Activities on the Site including earthmoving and stream bank restoration can potentially impact the Shenango River and physical characteristics criteria. Any Site actions must comply with the substantive requirements.

Discharge of Storm Water Runoff 40 C.F.R .§ 122.26 is applicable because storm water runoff from Site remediation may result in runoff to the Shenango River and its tributaries. Any such runoff must comply with the substantive requirements.

Erosion and Sediment Control Requirements 25 Pa. Code 102.4(b)(1) is relevant and appropriate because any earth disturbance activities at the Site shall meet the substantive requirements of this regulation.

Structures and Activities in Wetlands 25 Pa. Code §§ 105.14-105.17 is applicable if Site remediation involves wetlands.

National Primary and Secondary Ambient Air Quality Standards 40 C.F.R. § 50.12 is applicable if remediation and excavation of soil result in emission of contaminants into the air.

Fugitive Emissions 25 Pa Code § 123.1 is applicable if remediation results in fugitive emissions from demolition of buildings; clearing of land; and stockpiling of materials.

The following is the key Location-Specific ARARs:

Pennsylvania Flood Plain Management Act 32 P.S. §§ 101-328 is relevant and appropriate to earthmoving activities in the Shenango River 100-year flood plain and associated wetlands

National Environmental Policy Act 42 U.S.C. §§4321-4370e, 40CFR § 6.302(b) will be considered if the remedial action impacts the flood plain

PA Fish and Boat Code 30 Pa. C.S. §§ 101-328 will be considered with respect to any discharges to the Shenango River

Each of the alternatives except for the no action alternative contains strategies to reduce surface water runoff and groundwater contaminant concentrations to achieve MCL's and maintain Ambient Water Quality Criteria in the long-term. At present, the surface water in the Shenango River is compliant with the Ambient Water Quality Criteria; however, due to the proposed Site activities, and the fact that contaminated source material (slag, sludge and groundwater) will remain in place after the remedial action is complete, surface water in the Shenango River will continue to be monitored to ensure future compliance with the MCL's and Ambient Water Quality Criteria..

Groundwater in the surficial aquifers contains metals and PAHs at levels that currently exceed MCL's. Each of the alternatives except for the no action alternative contains strategies to reduce groundwater contaminant concentrations to achieve MCL's in the long-term. Alternative 6a, 6 and 7 include the most active strategy for achieving MCL's in groundwater. The capping, groundwater barrier, and pump/treat technologies included in these alternatives could potentially achieve MCL's within 25 to 40 years. Alternative 4 is estimated to achieve the groundwater MCL's in a reasonable timeframe with the most passive of systems for treating contaminated groundwater. In Alternative 4 long term monitoring of contaminants shall be conducted throughout the extent of the groundwater plume to determine if the biosolid source control measures are effective in reducing contaminant concentrations in groundwater to drinking water standards. If restoration of the aquifer is unlikely to occur, a Focused Feasibility Study may be required to determine if alternative remedial action is necessary for the areas of the plume where cleanup levels will not be achieved in a reasonable timeframe.

Each of the alternatives except for the no action alternative can impact the Site through the Erosion and Sediment Control Requirements with earthmoving and stream bank restoration which can potentially impact the Shenango River and physical characteristics criteria. Any Site actions must comply with the substantive requirements. Additionally, each of the alternatives must comply with the substantive requirements for limiting impacts in the wetlands at the Site.

Long-Term Effectiveness and Permanence

The evaluation of alternatives under this criterion considers the ability of an alternative to maintain protection of human health and the environment over time, usually measured in one or more decades. The evaluation takes into account the residual risk remaining from untreated waste at the conclusion of remedial activities, as well as the adequacy and reliability of containment systems and institutional controls.

Alternative 1 does not provide any long-term or reliable protection of human health or the environment. One possible exception is the conditional long-term protection of human visitors/trespassers by implementing institutional controls at the Site; as long as the controls were enforced in the long-term, they would deter or restrict access to the Site.

The long term monitoring effectiveness and permanence provided for in Alternatives 3, 4, 6, and

7 would all provide some degree of long-term protection to human health and the environment through implementation of the capping/covering element, and would provide conditional long-term protection to human visitors/trespassers through implementation of institutional controls at the Site. Alternatives 3, 4, 6, and 7 would ensure long term protection to human health and the environment by including periodic investigations of sediment, groundwater, and surface water to ensure risks are decreasing with time after implementation of the remedy. The long term monitoring of the groundwater would continue until MCL's were achieved.

The cover systems proposed in these alternatives would all require some routine monitoring and maintenance to maintain; however, Alternatives 4 and 7 would require the least maintenance because they would support the rapid establishment of a diverse habitat of native grasses and shrubs. This habitat, by design, would require very little upkeep and would provide additional ecological habitat. Alternative 7 would also provide long term effectiveness and permanence. As long as the institutional controls were enforced in the long-term, and as long as the cap structure was not breeched, this remedial alternative would prevent or at least restrict exposure to contaminated source media.

Ecological risks may remain in downgradient habitats; however, it is believed that source area controls will allow contaminant levels to decrease over time in these areas while maintaining the habitat quality versus negatively impacting the wetlands with an invasive remedy such as in Alternatives 6 and 7. Alternative 4 may be more beneficial to the long term progress of the wetland area. Additionally, there are other non-Site related sources of contamination from industry located on the Shenango River which could recontaminate the wetland area if hot spots were excavated or armored ending in no benefit to the wetland area. Long term monitoring will be used to verify that the ecological risk has diminished.

The remedial technologies included in Alternatives 6 and 7 are expected to remediate groundwater; reduce migration of contamination into the Shenango River and risks associated with potential future groundwater use would be significantly minimized.

Reduction in Toxicity, Mobility, or Volume through Treatment

This evaluation criterion addresses the ***statutory*** preference for selecting remedial actions that employ treatment technologies that permanently or significantly reduce the toxicity, mobility, or volume of hazardous substances as their principal element.

Alternatives 1 and 3 do not include treatment as a component of the remedy and therefore, do not reduce the toxicity, mobility, or volume of contamination at the SSFW Site.

Alternatives 4, 6, and 7 would reduce the toxicity, mobility, and volume of contaminants from the Site through treatment. The introduction of groundwater treatment in Alternative 6 and 7 would reduce the volume and toxicity of contamination in groundwater due to the combination of covers, groundwater barriers, the extraction wells, and the treatment system. The groundwater treatment system element of Alternatives 6 and 7 will reduce the toxicity, mobility and volume of groundwater at the Site. The use of a biosolid enhanced cap associated with

Alternatives 4 and 7 could reduce toxicity of the source material and groundwater by reducing the bioavailability of the metals in the covered source material.

Short-Term Effectiveness

This evaluation criterion addresses the effects of the alternatives during the construction and implementation phase until remedial action objectives are ***implemented***. The criterion considers risks to the community and to on-Site workers. It also considers available mitigation measures, as well as the time frame for the attainment of the response objectives.

Alternative 1 is not effective in the short-term because no action is implemented with this option; and current risk would continue to exist.

Alternatives 3, 4, 6, and 7 could result in potential risks to construction workers during implementation. The grading associated with all of these alternatives could result in adverse short-term impacts if not carefully executed and could actually increase potential exposure to contamination in the short-term during the implementation phase of these remedial alternatives. Best management practices for dust suppression and erosion control should be used to minimize creation of excessive dust, dispersion, and runoff of contaminants.

All of these alternatives would involve the delivery of a significant amount of material to create the cover, which would create increased human risks due to increased local traffic. Impacts would be minimized by creating established trucking routes that minimize the use of small local streets and schedule delivery times to avoid high traffic times (morning and evening rush hours). Alternatives 4 and 7 would require the least amount of material to be imported to the Site because the biosolid material is used to supplement the existing waste slag/sludge to create the cover. The biosolids from local facilities would require transporting materials the least distance, thus minimizing the affect on traffic.

The work in aquatic habitats (sediment dredging and wetland soil excavation) in Alternatives 6 and 7 would likely destroy ecological habitat in the floodplain and wetland areas. These areas would need to be restored to be compliant with action and location specific-ARARs. Additionally, there are other non-Site related sources of contamination from industry located on the Shenango River which could recontaminate the wetland and floodplain area if hot spots were excavated or armored in Alternative 6 or 7 ending in no benefit to the wetland and floodplain area.

Alternative 6 would take the longest to implement due to the amount of work required for its implementation. Alternative 4 would be the fastest to implement due to the availability of biosolid material and would result in the fastest reductions in exposure to contamination.

Implementability

The evaluation of alternatives under this criterion considers the technical and administrative feasibility of implementing an alternative and the availability of services and materials required during implementation. Each of the alternatives is implementable, and the services and materials required for each alternative are available. However, some would be more difficult to implement than others.

Alternative 1 is most easily implemented since no activities to address remediation of contaminated media at the Site would be initiated.

Alternatives 4 and 7 are technically feasible and there is an abundance of Class A biosolid material available from local sources to easily implement this remedial action. A key benefit of the biosolid enhanced cover is that it allows for the beneficial reuse of a waste stream generated by municipal waste water treatment plants (biosolid sludge). Municipalities currently pay a significant amount of money to dispose of their waste sludge; however, some have begun processing their sludge into a biosolid material that can be sold or given away for agricultural land amendments to lower their operating costs.

The installation of the groundwater barrier and treatment system and the sediment armoring are implementable but would take additional time to be installed and become operational.

Alternatives 3 and 6 would be difficult to implement due to the large volume of topsoil or clay and the difficulty with finding local sources of this volume and transporting it to the Site. The Portland cement cap under Alternative 3 (c) of these alternatives may be more easily implemented as there are likely to be adequate sources of this material. Alternative 6 is the most difficult to implement due to the additional work required for the hot spot excavation, treatment, transportation, and off-Site disposal.

Cost
The Alternative Cost Summary Table (See Table 3) summarizes the capital, annual O&M, and total present worth costs for each alternative. The total present worth is based on an O&M time period of 30 years for an engineered cover system and environmental monitoring. For additional details on the cost estimate breakdown, see the Administrative Record.

Alternative 1 has the lowest cost as there are no actions associated with its implementation. Alternatives 4 and 7 are the least expensive action alternatives, largely as a result of the availability and low cost associated with the biosolid enhanced cap. Another key benefit of the biosolid Alternatives 4 and 7 is that it allows for the beneficial reuse of a waste stream generated by municipal waste water treatment plants (biosolid sludge). Municipalities currently pay a significant amount of money to dispose of their waste sludge; however, some have begun processing their sludge into a biosolid material that can be sold or given away for agricultural land amendments to lower their operating costs. Use of a biosolid to create an enhanced cover can provide cost savings for these municipalities.

Alternative 4 is less expensive than Alternative 7 due to the use of passive groundwater controls over more active engineered groundwater controls. Alternatives 6 and 7 with the groundwater pump and treat system would drive up the operation and maintenance costs for a long period of time. Alternatives 3 and 6 are the most expensive alternatives to implement, largely because of the capping costs. The costs associated with Alternative 3 cost are more than twice the costs of Alternative 4 and may not be significantly more effective. The groundwater treatment systems make Alternative 6 considerably more expensive than Alternative 3.

Overall, based on the currently available information, EPA believes that Alternative 4 would provide the best balance of tradeoffs among the other alternatives for the following reasons:

- It would achieve the RAOs established for the Site, reduce risks to human health to acceptable levels, and it would meet the ARARs for the Site. While this alternative would leave residual ecological risks, EPA believes that the source control remedial actions would allow contaminant concentrations in the impacted habitats to decrease over time without active remediation in the wetland and floodplain areas which could destroy existing habitat.
- It is the most easily implemented alternative available and offers the greatest combination of short-term benefits with minimal short- and long-term adverse impacts. This alternative could be implemented faster than the other alternatives, there is sufficient biosolids material readily available for the cover, and this alternative would allow for the creation of significant improvement in the ecological habitat value. In addition, this alternative could provide additional recreational opportunities (hunting, nature watching, and hiking) that are not currently available in this area.

- It would provide the most readily available and cost effective means of treating waste slag and sludge to decrease its leachability and toxicity while achieving protectiveness and meeting ARARs.

- It would provide a permanent solution to the problems at the Site and would require the least maintenance. Operation and maintenance costs with this alternative is the least and additionally the least amount of energy is used with this alternative compared to groundwater pump and treat Alternatives in 6 and 7.

8. State/Support Agency Acceptance

The Commonwealth of Pennsylvania supports the selection of Alternative 4 – Biosolid-Enhanced Cap and Passive Vegetated Groundwater Barrier with Institutional Controls and Long-Term Monitoring. The Pennsylvania Department of Environmental Protection signed a letter of concurrence for the preferred alternative on September 28, 2006.

9. Community Acceptance

A thirty-day public comment period on EPA's Proposed Plan for the Sharon Steel Farrell Works Site began on July 16, 2006. An advertisement announcing the issuance of the Proposed Plan and a public meeting to discuss the Plan was placed in the Sharon Herald and Ohio Vindicator. The public meeting was held on July 26, 2006 at the Stey Nevant Library located at 1000 Roemer Boulevard in Farrell, PA. The meeting was attended by approximately 23 members of the community. The community requested an additional thirty days to review the Sharon Steel Site documents further and EPA extended the comment period an additional 30 days with the public comment period ending September 13, 2006.

The community appears to fully support EPA's findings and preferred alternative. All attendees at the public meeting appeared to agree with EPA's preferred alternative. Some attendees questioned how the remedy would impact future redevelopment of the property. No one objected to EPA's preferred alternative, nor did anyone recommend an alternative approach. One letter was received by a resident who had a question on how the Site contamination would affect contamination on their property. The comments and EPA's responses are provided in the Responsiveness Summary.

The residents are aware of the availability of a Technical Assistance Grant and may pursue this option. A copy of the transcript of the public meeting is included in the Administrative Record.

XI. PRINCIPAL THREAT WASTES

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable and engineering controls, such as containment, for a waste that poses a relatively long-term threat (NCP 300.430 (a)(1)(iii)(A)). The principal threat concept is applied to the characterization of source materials at a Superfund Site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or act as a source for direct exposure (EPA Superfund Publication 9380.3-06FS, November 1991).

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. They include liquids and other highly mobile materials (e.g. solvents) or materials having high concentrations of toxic compounds.

EPA considers the slag and sludge source materials and dust from these areas to be principal threat wastes since they are most likely to transport metals in air through dust and leach metals into the shallow groundwater which then transports contamination to the wetland area, ponds and the Shenango River. The slag and sludge will be treated with a biosolid cap and vegetation, while groundwater migration will be reduced using poplar trees within the floodplain of the Shenango River during the implementation of Biosolid-Enhanced Cap and Passive Vegetated Groundwater Barrier with Institutional Controls and Long-Term Monitoring, Alternative 4.

XII. SELECTED REMEDY

Following consideration of the requirements of CERCLA, a detailed analysis of the alternatives using the nine criteria set forth in the NCP, and careful review of public comments, EPA has selected***, Soil Alternative 4: Biosolid Enhanced Cap and Passive Vegetated Groundwater***

Barrier with Institutional Controls and Long Term Monitoring for implementation at the Sharon Steel Farrell Works Superfund Site. (See Figure 4***)***

Summary of the Rationale for the Selected Remedy

EPA's preferred alternative for the SSFW Site is Alternative 4 – Biosolid-Enhanced Cap and Passive Vegetated Groundwater Barrier with Institutional Controls and Long-Term Monitoring. EPA's preferred alternative includes the following:

Re-grading and contouring the Site to prevent erosion of slag materials from the Site into the Shenango River and adjacent habitats. Class A biosolids will be blended with the top layer to create a protective cover over the contaminated slag and sludge. This will prevent contact with the slag and sludge material and prevent the migration of slag dust from the Site. The biosolids cap will also minimize infiltration of metals to the groundwater. The biosolid cap will provide treatment of the slag and sludge by binding with the metals. This treatment will reduce the mobility of the metals to the groundwater.

Long term monitoring of contaminants shall be conducted throughout the extent of the groundwater plume to determine if the biosolid source control measures are effective in reducing contaminant concentrations in groundwater to drinking water standards. The specific wells and sampling locations, will be determined during the Remedial Design in the form of a Long Term Monitoring Plan. At the second Five Year Review, EPA will evaluate the monitoring data to determine the effectiveness of the source control components of the remedy and whether the cleanup of groundwater throughout the entire plume is likely to occur in a reasonable timeframe. If restoration of the aquifer is unlikely to occur, a Focused Feasibility Study and a modification to the Record of Decision may be required to determine if alternative remedial action is necessary for the areas of the plume where cleanup levels will not be achieved in a reasonable timeframe.

Additionally, there would be installation of perimeter fencing and signs to limit trespasser exposure until the biosolid cap is established on Site. This remedy will be constructed over all slag and sludge areas and the Shenango River Floodplain north of Ohio Street. It will not be constructed over non-source areas (the floodplains, wetlands and ponds, or the streams) south of Ohio Street. It is believed that source area controls will allow contaminant levels to decrease over time in these areas while maintaining the habitat quality without negatively impacting the wetlands with an invasive remedy. Long term monitoring will be used to verify that the future conditions of the sediment areas will improve.

- An environmental monitoring strategy for groundwater, surface water, and sediment will be required to ensure ecological risks are decreasing with time after the remedy is implemented. Environmental monitoring measures will be specified in a Long-Term Monitoring Plan to be developed during Remedial Design.

- The Biosolid Cap Area will provide a re-vegetated area suitable for wildlife habitat.

- A passive vegetated groundwater barrier will be installed to reduce the volume of contaminated shallow groundwater currently being discharged into the Shenango River. This would include:

    - Native poplar trees will be planted between the source areas and the Shenango River. Poplar trees can draw as much as 30 gallons of groundwater per day. Planting these trees just above the Shenango River will allow the root systems of these trees to reduce the volume of contaminated groundwater being discharged from the surface aquifers

- Erosion protection measures will be implemented to prevent the erosion of waste slag and sludge into the Shenango River and the wetland/pond area. While it is unclear if PAHs in the Shenango River sediment that produce a risk to potential industrial workers are Site-related, the remedial action proposed would eliminate migration of future PAHs from the Site into the Shenango River. These measures would include:

    - Streambank stabilization of the west bank of the Shenango River along its frontage with the SSFW Site. The bank of the Shenango River would be excavated to create a broad and level floodplain at the normal high water elevation. This bank would be stabilized using a combination of bioengineering techniques including block placement with willow plantings supplemented by natural stream channel structures (in high erosion areas). Streambank stabilization would not be conducted in the Southern Area since there are no waste piles adjacent to the river and the river bank is well forested.
    - Enhance the vegetative buffer between the Site wetlands and off-site wetlands/pond to help further control potential migration of COCs in sediment.
    - Silt fencing will be anchored along the north perimeter of the wetland/pond habitat to prevent the inflow of eroded material from the adjacent slag piles into the wetland.

- Implementing institutional controls for the Site which would include:

    - Prohibiting the use of Site groundwater for drinking water purposes to prevent unacceptable exposure to contaminated ground water.
    - Restriction of certain property uses to prevent activities, such as construction, that would adversely affect the protective cover or other components of the remedy.
    - Restrict use of property to prevent residential use.

EPA's preferred alternative would satisfy the statutory requirements of CERCLA §121(b) by being protective of human health and the environment; complying with ARARs; being cost-effective; utilizing permanent solutions and alternative treatment technologies to the maximum extent practicable; and satisfying the preference for treatment as a principal element. The total present worth cost of EPA's selected remedy is $10,745,000.

The selected alternative will meet all ARARs and provide a long-term and permanent solution. The selected alternative also offers short-term effectiveness, provided appropriate controls and plans are in-place.

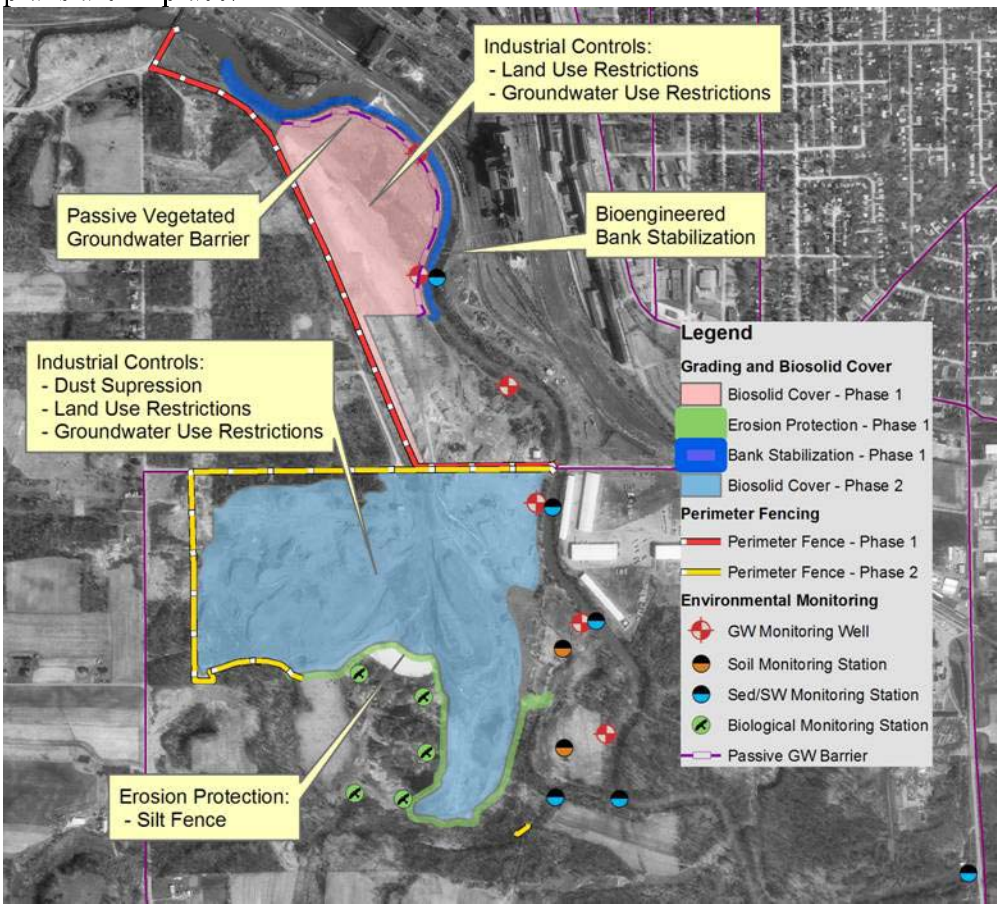


Figure 4: Features of Recommended Alternative

Summary of the Estimated Remedy Costs

The estimated cost of implementing Alternative 4 is $8,727,200 in capital cost and approximately $67,260 per year for operation and maintenance. The total present worth cost is $10,745,000.

Performance Standards

Performance Standards were developed to address unacceptable risks posed by the Site and to comply with ARARs. The major goals of the remedy for the treated slag and sludge area include: 1) effective reduction in the mobility and transport of Site related contaminants to: groundwater; surface water (the unnamed tributary and the Shenango River); and adjacent terrestrial areas through dust generation.

This alternative will be effective by being protective in both the long-term and short-term and will reduce the mobility of contaminants of concern from the principal threat material (slag and sludge) to air, groundwater and surface water. A bench scale treatibility study is currently being conducted by EPA to establish baselines for soil samples on Site to establish optimum quantity levels for the biosolid treatment on Site soils.

<u>Performance Standards for Biosolid Cap</u>

All slag/sludge areas shall be regraded and capped with Biosolid material. The effectiveness of the Biosolid Cap will be determined by the reduction of COCs following completion of the construction . Specific criteria are the following:

- A 75% reduction in the leachability of metals from source areas, as measured by a leachability test of treated soil after two years following the completion of construction of the Phase 1 cap;

- A 90% reduction in the leachability of metals from source areas as measured by a leachability test after five years following the completion of construction of the Phase 1 cap;

- An 80% vegetative cover within two years following the completion of construction of the Phase 1 cap. In Remedial Design it will be determined how large the 20% non-vegetated patch on Site can be.

Performance Standard for <u>Groundwater</u>

- Achieve MCL's of Site related COCs to restore beneficial use of the shallow groundwater aquifer. Long term monitoring of contaminants shall be conducted throughout the extent of the groundwater plume to determine if the above source control measures are effective in reducing contaminant concentrations in groundwater to drinking water standards. The specific wells and sampling locations, as well as the frequency of sampling will be conducted by EPA in the form of a Long Term Monitoring Plan during the Remedial Design phase. At the 2nd Five Year Review, EPA will evaluate the monitoring data to determine the effectiveness of the source control components of the remedy and whether the cleanup of groundwater throughout the entire plume is likely to occur in a reasonable timeframe. If restoration of the aquifer is unlikely to occur, a Focused Feasibility Study may be required to determine if alternative remedial action is necessary for the areas of the plume where cleanup levels will not be achieved in a reasonable timeframe.

Expected Outcome of the Selected Remedy

The selected remedy will:

- Reduce the migration of COCs through biosolid treatment of principal threat material and a passive vegetative barrier between sources areas and surface water bodies at the Sharon Steel Superfund Site. Implementation of the selected remedy with the completion of the biosolid cap is expected to achieve all of the remedial action objectives.

- It is anticipated that contamination in the shallow groundwater will decrease and reach MCL's in a reasonable timeframe and will be evaluated during the Five Year Reviews.

- In the Shenango River the Chronic Federal Ambient Water Criteria for contaminants related to the Site must be maintained.

- The vegetative cover will result in decreased wind erosion and thereby releases to the air. A 80% vegetative cover within two years of the Phase 1 construction completion will have to be sustained for the air pathway to be eliminated.

- Implementing an environmental monitoring strategy for groundwater, surface water, and sediment will ensure risks are decreasing with time after implementing the biosolid treatment remedy. A monitoring plan will be completed during design.

In addition to the reduction in the leachability of metals from the source area, the remedy in total will reduce the water infiltration through the principle threat material (through the creation of a cap) In addition, the vegetation will remove water from the source areas through evapotranspiration. These aspects of the remedy will reduce the loading of contaminants to the groundwater. Reduction in the transport of contaminants to the surface water will be accomplished through the reduced loading of contaminants to the ground water and the subsequent discharge of that ground water to the surface water. In addition, surface runoff load bulk transport and leading of contaminants to runoff water will be reduced via the reduced leachability of contaminants and the reduced erosion resulting from the vegetative cover.

The Southern Area, which consists of approximately two hundred and thirty one acres and includes those areas south of Ohio Street-the Southern Slag Source Pile and the wetlands/***floodplain*** located between the slag piles and the Shenango River (to the east) and the unnamed tributary (to the south) (see Figure 1 & 2) is currently being mined by a Prospective Purchaser Party,. The Prospective Purchaser Party operates an active slag mining operation on the Southern portion of the Site permitted by Pennsylvania Department of Environmental Protection (PADEP) and authorized by EPA pursuant to a Prospective Purchasers Agreement. The Prospective Purchaser Party will reduce the volume of contaminated waste slag at the Site by continuing to mine and remove slag from the Southern Area. Mining is expected to remove over 3 million cubic yards of slag from the Site which is beneficially reused to make road aggregate. However, due to technical limitations (groundwater dewatering) and cost/benefit considerations, the Prospective Purchaser Party will not remove the last four feet of slag. This will leave approximately four feet of slag over the original native soil in the Southern Area.

In both the public official briefing and public meeting for the proposed plan, EPA solicited the publics' and local officials' preference for future use of the Site. The Site is currently zoned in an industrial area. There was interest from the officials and the public to put in a road through the Site for access from Pennsylvania to Ohio. Other possibilities for use of the Site included open space and developing industrial facilities on the Site.

XIII. STATUTORY DETERMINATIONS

Section 121 of CERCLA requires that the selected remedy be protective of human health and the environment, comply with ARARs, be cost effective, and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Additionally, CERCLA includes a preference for remedies that use treatment to significantly and permanently reduce the volume, toxicity, or mobility of hazardous wastes as their principal element. The following sections discuss how the selected remedy for the Site meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will provide protection of human health and the environment by treating the slag and sludge on the Northern and Southern areas comprising approximately two hundred and ninety two acres of the Site (excluding the Asphalt Plant and trucking company parcel which will be addressed as OU-2 in a separate proposed plan) and the successfulness of the biosolid treatment will be measured through the Performance Standards. There will be a separate Record of Decision for the Asphalt Plant and trucking company parcel.

EPA has determined, based upon the baseline Human Health Risk Assessment for the Site (See Table 1), that measures should be undertaken to reduce potential risk from soil contaminants COCs, shallow groundwater COCs, and components from slag and sludge in dust COCs, sediment COCs. These contaminants on Site were selected because potential health risks for some exposure scenarios exceed EPA's target range of 1×10^{-4} and 1×10^{-6} for lifetime cancer risk or a non-cancer Hazard Index of one (1.0).

EPA has determined from the ecological risk assessment (See Table 2) at the Sharon Steel Site that all habitats contained contaminated media that present a risk to ecological communities. The primary sources of the contaminants are the Northern and Southern Slag Piles and the BOF Sludge Area.

The biosolid cap, passive vegetated groundwater barrier, institutional controls and long term monitoring called for in the selected remedy will prevent exposure from contaminated slag, soils and dust; prevent exposure from on Site contaminated groundwater by implementing institutional controls; reduce future migration of chemicals into groundwater so that the aquifer can be restored to its beneficial use; and reduce surface runoff and groundwater discharge to prevent further migration of waste materials and associated contaminants of concern into the wetlands and the Shenango River. The EPA has assumed that the Site properties will remain under industrial usage into the foreseeable future.

Implementation of the selected remedy will not pose any unacceptable short term risks or cross media impacts to the Site, or to the community.

Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with all Federal and State requirements, standards, criteria, and limitations that are applicable or relevant and appropriate, as required by section 121(c) of CERCLA, 42 U.S.C. § 9621(c). The selected remedy will comply with all applicable or relevant and appropriate chemical-specific, action-specific, and location-specific ARARs. In addition, the selected remedy will meet all To Be Considered Standards (TBCs). Those major ARARs and TBCs are the following (See Table 4):

Chemical-Specific ARAR

The Federal Ambient Water Quality Criteria (AWQC) 33 U.S.C. § 1314 for chronic effects in the Shenango River will be relevant and appropriate to ensure ambient water quality criteria which deal with fish ingestion and protection of aquatic life are relevant and appropriate to the Shenango River.

The Federal Maximum Contaminant Levels (MCLs) and/or Maximum Contaminant Level Goals (MCLGs) for drinking water established under the Safe Drinking Water Act 42 U.S.C. §§300g-l will be relevant and appropriate to ensure that the migration of Site-related contamination in groundwater discharge is within acceptable limits for human consumption. These MCLs and MCLGs will also apply to groundwater as ARARs for restoration of the surficial aquifers at the Site.

Action-Specific ARAR

Federal Ambient Water Quality Criteria for the Protection of Aquatic Life 33 U.S.C. § 1314 is relevant and appropriate because the designated uses for the Shenango River at the Site include fishing and protection of aquatic life. Activities on the Site including earthmoving and stream bank restoration can potentially impact the Shenango River and physical characteristics criteria. Any Site actions must comply with the substantive requirements.

Discharge of Storm Water Runoff 40 C.F.R .§ 122.26 is applicable because storm water runoff from Site remediation may result in runoff to the Shenango River and its tributaries. Any such runoff must comply with the substantive requirements.

Erosion and Sediment Control Requirements 25 Pa. Code § 102.4(b)(1) is relevant and appropriate because any earth disturbance activities at the Site shall meet the substantive requirements of this regulation.

Structures and Activities in Wetlands 25 Pa. Code §§ 105.14-105.17 is applicable if

Site remediation involves wetlands.

National Primary and Secondary Ambient Air Quality Standards 40 C.F.R. § 50.12 is applicable if remediation and excavation of soil result in emission of contaminants into the air.

Fugitive Emissions 25 Pa Code § 123.1 is applicable if remediation results in fugitive emissions from demolition of buildings; clearing of land; and stockpiling of materials.

Location-Specific ARAR

Pennsylvania Flood Plain Management Act 32 P.S. §§ 101-328 is relevant and appropriate to earthmoving activities in the Shenango River 100-year flood plain and associated wetlands

To Be Considered Standards (TBC)

Threshold Limit Values will be considered by Industrial Hygienists to identify levels of airborne contaminants in which a health risk may be associated.

National Environmental Policy Act 42 U.S.C. §§4321-4370e, 40CFR § 6.302(b) will be considered if the remedial action impacts the flood plain

PA Fish and Boat Code 30 Pa. C.S. §§ 101-328 will be considered with respect to any discharges to the Shenango River

Cost Effectiveness

The NCP at 40 C.F.R. § 300.430(f)(1)(ii)(D), requires EPA to evaluate cost-effectiveness by comparing all the alternatives meeting the threshold criteria--protection of human health and the environment and compliance with ARARs--against long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; and short-term effectiveness (collectively referred to as “overall effectiveness”). The NCP further states that overall effectiveness is then compared to cost to insure that the remedy is cost effective (See Table 4).

EPA concludes, following an evaluation of these criteria, that the selected remedy is cost-effective in providing overall protection in proportion to costs and meets all other requirements of CERCLA. The estimated present value of the selected remedial action is $10,745,000.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable through the biosolid treatment of slag and sludge in which the effectiveness will be measured through performance measures. Treatment of metal contamination shall be provided via the reduction of metals through treatment of slag and sludge with a biosolid cap.

Preference for Treatment as a Principal Element

The selected remedy satisfies the statutory preference for treatment as a principal element. The remedy includes the treatment of the slag and sludge through the use of the biosolid cap. The mobility of the metals contained in the slag/sludge will be reduced. Biosolids have been demonstrated to reduce the bioavailability and toxicity of contaminated soils. The biosolid material treatment reduces metals availability and increases soil fertility to restore function of ecosystems.

Five Year Review Requirements

Section 121(c) of CERCLA, 42 U.S.C. § 9621 (c), and section 300.430(f)(4)(ii) of the NCP require review of the remedy if the remedy results in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure. Any such review must be conducted no less often than every five years after initiation of the remedial action.

Because hazardous substances will remain at the Sharon Steel Farrell Works Site, the review described by section 121(c) of CERCLA, 42 U.S.C. § 9621and section 300.430(f)(4)(ii) of the NCP will be conducted no less often than every five years after initiation of the remedial action.

Documentation of Significant Changes

The Proposed Plan for the Sharon Steel Farrell Works Site was released for public comment on July 16, 2006 with interest from the public to extend the comment period for review of the Site documents. The comment period was extended another thirty days with the comment period ending September 13, 2006. The Proposed Plan identified EPA's preferred alternatives for slag, sludge, and groundwater, the alternatives selected in this ROD. The remedy selected in this ROD involves no changes to the preferred alternative identified in the Proposed Plan.

Glossary

Acute: Short term high dosage period

Administrative Record: EPA's official compilation of documents, data, reports, and other information that is considered important to the status, and decisions made, relating to a Superfund Site. The record is placed in the information repository to allow public access to the material.

Air/dust dispersion model: A computer model used to study and predict the transport of air or transport of dust in the air.

Applicable or Relevant and Appropriate Requirements (ARARs): The federal and state requirements or criteria that are determined to be legally applicable or relevant for the Site clean-up work.

Aquifer: A layer of rock or soil that can supply usable quantities of ground water to wells and springs. Aquifers can be a source of drinking water and provide water for other uses as well.

Artesian conditions: When a confined aquifer contains groundwater that will flow upwards out of a well without the need for pumping.

Background levels: The concentrations of substances in environmental media (air, water, soil, etc) that are not related to the Site in question. They may occur naturally or as a result of human activities other than the Site.

Benchscale treatability study: A small study conducted in a laboratory to test the effectiveness of a remedial treatment or innovative technology on contaminated Site materials.

Benthic invertebrates: Aquatic animals found in streams, rivers, ponds, lakes, and wetlands that live in sediment, on/under rocks, wood and leaf litter.

Benthivores: Aquatic or terrestrial animals that primarily eat benthic invertebrates.

Bioaccumulation: An increase in the concentration of a chemical in a plant or animal over time, compared to the chemical's concentration in the environment.

Bio-engineered bank stabilization techniques: Techniques that are designed (or engineered) to stabilize or re-build the banks of rivers and streams to prevent erosion. These techniques include erosion blankets, planting vegetation, and bank reconstruction.

Biosolid: Solid, semi-solid, or liquid materials generated from primary, secondary, or advanced treatment wastewater or sewage, often used as fertilizer.

Capital costs: The total purchase price.

Carcinogenic: An agent which causes or contributes to the occurrence of cancer.

Chronic: Long duration low dosage period

Class A biosolids: Class A biosolids contain very low levels of pathogens, or agents that cause disease. To achieve Class A certification, biosolids must undergo heating, composting, digestion or increased pH that reduces pathogens to low levels.

Code of Federal Regulations (CFR): For example, the citation 40 C.F.R. 260 means Title 40 of the Code of Federal Regulations, Part 260.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and amended several times subsequently. The Act created a Trust Fund, known as Superfund, with funds available to investigate and clean up abandoned or uncontrolled hazardous waste Sites.

Confining bed: A hydrogeologic unit of impermeable or distinctly less permeable material bounding or restricting one or more groundwater aquifers.

Contaminant: Any physical, chemical, biological, or radiological substance or matter that has an adverse effect on air, water, or soil.

Crushed rock stabilization: The use of gravel and crushed rock to stabilize a bank of a river or stream.

Depressed biological community: A biological community that shows evidence of being adversely impacted, altered, or degraded.

Ecological communities: Groups of plant and animal life that depend on each other for food, water, and shelter.

Erosion: A process or group of processes (including weathering, dissolution, abrasion, corrosion, and transportation) by which loose or consolidated earth materials are dissolved, loosened or worn away and moved from one place and depoSited in another.

Feasibility Study (FS): A report that identifies and evaluates alternatives for addressing the contamination that presents unacceptable risks at a Superfund Site.

Floodplain: An area that borders a body of water (e.g. river) and is subject to flooding.

Geomembrane/Geosynthetic: These sheet materials are either manmade (e.g., plastic) or manmade compoSites (e.g., clays sandwiched in fabric) and are used in the earth ("geo") or soils for filtration, drainage, protection, separation, reinforcement, sealing and erosion control.

Glaciated: Formed by the process of glaciation or a geological phenomenon in which massive ice sheets form in the Arctic and Antarctic and advance toward or away from the equator.

Groundwater: The water beneath the earth's surface that flows through the soil and rock openings and often serves as a source of drinking water.

Hazard Index (HI): A numeric representation of non-cancer risk. A HI exceeding one (1) is generally considered an unacceptable non-cancer risk.

Hot spots: A discrete area that exhibits high levels of contamination.

High-fertility: Having a high ability to reproduce.

Infiltration: The process by which water on the ground surface enters the soil.

Impervious: Eliminating the infiltration of rainwater or natural groundwater recharge.

In-situ: At Superfund Sites this generally refers to treatment of contaminated soil in place rather than removing the soil first.

Institutional Controls: Non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use.

Long-term monitoring: Monitoring (or sampling) to assess the effectiveness of the remedial alternative in meeting the clean-up limits and reducing the risk to human health and the environment.

Low-permeability: Having a low ability to allow the passage of a liquid, such as water through rocks.

Maximum Contaminant Levels (MCLs): Enforceable standards for public drinking water supplies under the Safe Drinking Water Act. Theses standards apply to specific contaminants which EPA has determined have an adverse effect on human health above certain levels.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The federal regulations found at 40 C.F.R. Part 300 that provides the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants and contaminants under the Superfund program.

National Priorities List (NPL): EPA's list of the nation's top priority hazardous waste Sites that are eligible to receive federal money for response under CERCLA.

Natural attenuation: The reliance on natural processes (within the context of a carefully controlled and monitored Site clean-up approach) to achieve Site-specific remediation objectives within a time frame that is reasonable compared to that offered by other more active methods. The 'natural attenuation processes' that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater.

Organic Compound: A carbon-based material.

Passive Vegetated Groundwater Barrier: A barrier placed between a contaminant source area and a feature to be protected that uses trees or plants to draw groundwater up out of the ground and minimize the amount of groundwater that passes through.

Pathways: Routes which contaminants may follow as they move by gravity or ground water flow. In addition, an exposure pathway is the route a contaminant takes in reaching a potential receptor, such as a person, animal or plant.

Porosity: Degree to which soil, gravel, sediment, or rock is permeated with pores or cavities through which water or air can move.

Present worth costs: The sum of the present values of the annual cash flows minus the initial investment.

Promulgated: When a law receives final formal approval.

Prospective Purchaser Party: A party who has purchased the Site (rights) subsequent to an agreement with EPA.

Record of Decision (ROD): A public document that describes the remedial actions selected for a Superfund Site, why certain remedial actions were chosen as opposed to others, and how much they will cost. It summarizes the results of the Remedial Investigation and Feasibility Study reports and the comments received during the comment period for the Proposed Plan.

Remedial Action (RA): The actual construction or implementation phase of a Superfund Clean-up following a Remedial Design (RD).

Remedial Action Objectives (RAO): The goals of a remedial action.

Remedial Investigation (RI): A study which identifies the nature and extent of contamination at a Superfund Site and forms the basis for the evaluation of environmental and human health risks posed by the Site.

Remedial Investigation/Feasibility Study (RI/FS): A report composed of two scientific studies, the RI and the FS. The RI is the study to determine the nature and extent of contaminants present at a Site and the problems caused by their release. The FS is conducted to develop and evaluate options for the clean-up of a Site.

Resource Conservation and Recovery Act (RCRA): A federal law that established a regulatory system to track hazardous waste from the time of generation to disposal including requirements for treating, transporting, storing and disposing of hazardous waste.

Risk Assessment: A human health or ecological evaluation process which provides a framework for determining the potential health hazards from contamination at a Site.

Screened: Slotted to keep out soil particles while allowing water to flow freely. Groundwater well casings are screened.

Sediment: Particles of soil, sand and minerals washed from land into water.

Seeps: Areas where ground water discharges along the banks into the surface water bodies.

Slag: Soil-like material left as a residue from the smelting of metallic ore. A by-product of the steel industry.

Sludge: Semi-solid material. A solid by-product of the steel making process. At the SSFW Site, the sludge is a powdery-fine, rust-colored solid.

Species populations: The collection of a particular plant or animal, living in a given geographic area, or space.

Statutory: Enacted, regulated, or authorized by a law.

Superfund: The common name used for CERCLA.

Topographic depression: A landform that is sunken or depressed below the surrounding area.

Vermivores: Animals that primarily eat worms and other worm-like animals.

RESPONSIVENESS SUMMARY FOR THE PROPOSED REMEDIAL ACTION PLAN

AT THE

SHARON STEEL—FARRELL WORKS SUPERFUND SITE

Mercer County, PA

Public Comment Period: July 16, 2006 – September 13, 2006

RESPONSIVENESS SUMMARY
SHARON STEEL—FARRELL WORKS SUPERFUND SITE
COMMENTS ON THE PROPOSED PLAN

This Community Relations Responsiveness Summary is divided into the following sections:

Responses - Part One: EPA answered nearly all verbal questions presented during the public meeting. This section provides a summary of major issues and concerns, and expressly acknowledges and responds to those raised by the local community and unanswered at a public meeting held by EPA on July 26, 2006. “Local community” here means those individuals who have identified themselves as living in the immediate vicinity of this Superfund Site, and or their elected officials, and are potentially threatened from a health or environmental standpoint. These may include local homeowners, businesses, the municipality, and potential responsible parties. A copy of the entire transcript of the public meeting is included in the Administrative Record.

Responses - Part Two: This section provides a comprehensive response to all significant written comments received by EPA. Where necessary, this section elaborates with technical detail on answers covered in Part One.

EPA’s responses include clarification of the proposed remedy, and where appropriate, policy issues. It should be noted that the comments on the Proposed Plan have been considered and included in the Record of Decision, where appropriate.

Part 1– Comments from Sharon Steel—Farrell Works Superfund Site Public Meeting

During the Public Meeting, EPA responded to questions from the local community concerning: the completion of the ROD, the completion of and contracting for the Remedial Design, estimated construction start and end dates, construction on the Site parcels, location of groundwater monitoring wells, exclusion of the physical Sharon Steel plant from the Remedial Action because of Resource Conservation and Recovery Act (“RCRA”) regulation, a presentation and explanation of the biosolid cap remedy, slag removal and compost blending, the cost of the remediation and the projected size of the area to be addressed, the property’s current zoning, and the PADEP’s concurrence with the proposal. Additional comments that were either unanswered or which require an expanded answer are addressed below. Moreover, any points of conflict or ambiguity between information provided verbally at the public meeting and in writing below in this Responsiveness Summary will be resolved in favor of the detailed technical and legal presentation contained herein.

1. **Comment 1 from a Hermitage Resident:**

Which company will handle the Remedial Design? Will it necessarily be Black and Veatch?

EPA Response to Comment 1:
One of the Remedial Action Contractors who have a contract with EPA will get the

Remedial Design work assignment. It is expected that the Remedial Design work will be awarded shortly after the ROD is issued.

2. **Comment 2 from a Hermitage Resident:**

If 232.2 acres will have to be capped, could the actual tonnage of biosolids coming in be significantly greater than 13,000 tons?

EPA Response to Comment 2:

The actual tonnage of biosolids needed for the entire Site clean-up including the Phase 1, Northern portion of the Site (excluding the asphalt plant and trucking company properties) and Phase 2, the Southern portion of the Site is likely to exceed 13,000 tons. The application of the biosolid material will be done in two phases and done section by section as determined in the remedial design.

3. **Comment 3 from a Hermitage Resident:**

Why isn't EPA addressing the physical Sharon Steel Plant itself in the clean-up operations?

EPA Response to Comment 3:

The EPA is not addressing the Sharon Steel Plant in its clean-up because the Sharon Steel Plant is not part of the Sharon Steel Farrell Works Superfund Site. The Sharon Steel Farrell Works Superfund Site is the slag disposal area West of the Shenango River with the clean-up being addressed by EPA. The Sharon Steel Plant is not part of the Superfund Site and is East of the Shenango River. The Sharon Steel Plant is under the jurisdiction of the Pennsylvania Department of Environmental Protection (PADEP). The PADEP contact information is listed as follows: PADEP, Northwest Regional Office, 230 Chestnut Street, Meadville, PA 16335, Environmental Clean-up Program, 814-332-6648, Special Projects: Section Chief: John O'Hara, Project Manager: Bob Voegel. To schedule a file review call: Linda Conaway at 814-332-6340.

4. **Comment 4 from a Hermitage Resident:**

How much Slag has washed into the river?

EPA Response to Comment 4:

There is no way to estimate the total historical amount of slag which has eroded into the Shenango River. The EPA clean-up will stabilize the banks along the Shenango River so that erosion of the slag into the Shenango River is reduced.

5. **Comment 5 from a Hermitage Resident:**

Will there be another public meeting to address everyone's concerns?

EPA Response to Comment 5:

The EPA has to address all public comments in writing that were not answered at the Sharon Steel Farrell Works Public Meeting on July 26, 2006 and address any written comments received on the Sharon Steel Proposed Plan. The EPA responses to the public will be in the Responsiveness Summary in the Record of Decision. After the EPA reviews the public comments, the EPA will determine if the proposed remedy should be selected. If based on public comments there are fundamental changes to the proposed remedy, EPA will issue a new proposed plan and have another public meeting.

6. **Comment 6 from an Interested Party:**

Will you be moving 63,000 truckloads of biosolid material?

EPA Response to Comment 6:

See response to Comment #2 above.

7. **Comment 7 from an Interested Party:**

I am concerned that not all of the interested property owners were given proper notice of the proposed plan.

EPA Response to Comment 7:

The EPA distributed 2,500 fact sheets to the community summarizing the proposed plan to the community before the public meeting and discussed the proposed clean-up with owners of the Sharon Steel Farrell Works Site. Additionally, the comment period was extended an additional thirty days at the request of the community.

8. **Comment 8 from an Interested Party:**

When you're looking at your remediation plan you're, I would think, going to have to look at the consideration providing some corridor for drainage. Otherwise, all this acreage up above [the Site] is not going to be suitable for development because of the runoff concerns.

EPA Response to Comment 8:

In the Remedial Design phase EPA will devise a plan to handle the drainage at the Site and the contributory drainage from the surrounding watershed.

9. **Comment 9 from an Interested Party:**

Can you define specifically which areas contain sludge, slag or a potential mixture? Could you define specifically what the concerns are with the contamination in the slag? How do the metals in the slag exceed contaminant levels as determined by the state?

EPA Response to Comment 9:

The Remedial Investigation/ Feasibility Study Report, and the Proposed Plan define the location of slag and sludge on the Site. The Risk Assessment Report desscribes in detail the concerns associated with the contamination in the slag. In short, the metals in the slag and sludge are of concern because the metals are infiltrating the shallow groundwater aquifer, washing into the Shenango River, and causing a potential air inhalation concern. All risk assessment documents can be viewed at EPA's office in Philadelphia, Pennsylvania or at the Stey Nevant Public Library in Farrell Pennsylvania or online at www.epa.gov/arweb. EPA addresses media and contaminants of concern based on the human health and ecological risk assessment at the Superfund Site.

10. **Comments 10 from Residents on Future Use of the Site:**
Will the remediated area have any future potential use?

EPA Response to Comment 10:
Once the EPA finishes the clean-up, institutional controls will be required to prevent or limit exposure to hazardous substances, pollutants or contaminants by restricting land and/or water use at the Sharon Steel Farrell Works Superfund. Interested parties may submit written proposals on future use of the Site and EPA will consider proposals that do not interfere with the long-term effectiveness of the remedy and complies with the Institutional Controls for the Site.

11. **Comment 11 from a Resident:**
I understand that the future use won't be residential. But they won't be cleaning up anything any better than it already is; so why are they doing it in the first place?

EPA Response to Comment 11:
EPA is performing a cleanup at the Sharon Steel Farrell Works (SSFW) Site to address the risk to human health and the environment posed by existing Site contamination. EPA has selected a remedy that will address the risks and is based on present and projected future land use. The selected remedy is consistent with industrial zoning.

<u>Part 2 – Sharon Steel—Farrell Works Superfund Site Response to Written Comments</u>

1. **Comment 1 from a Concerned Citizen:**
I own parcels of land that are located near the Site. I believe that contamination from the Site is leaching onto our property. Will EPA clean up the land that belongs to us?

EPA Response to Comment 1:
The remedial investigation data has indicated that, while residual contamination has previously entered these habitats, the contamination is below levels that present a threat to human health and does not warrant a clean up. The ecological risk assessment has indicated the potential for low levels of risk to ecological receptors. To avoid the loss of ecological habitat and direct loss of plants and animals through the remedial process, the actions proposed at the Site are designed to reduce contamination that may impact your property by:

1. Eliminating the erosion slag and storm run-off from the Site on to your property
2. Reducing the amount of contamination that may impact groundwater.

Reducing the inflow of contaminants to the wetland and pond on the Site, will allow natural processes (dilution, dispersion, metal reduction) to improve these areas. Details describing the particulars of these processes are contained in the Feasibility Study and the Record of Decision, which are both available in the Administrative Record at EPA's Office in Philadelphia, Pennsylvania, the Stey Nevant Public Library in Farrell and online at www.epa.gov/arweb.

2. **Comment 2 from an Interested Party:**

We request the detailed cost estimates of the seven (7) alternatives, considered. The information provided in the Proposed Plan provides only four items, total Capital Costs, Annual O&M costs, Present Worth of O&M at an unspecified rate, and Total Present Worth.

EPA Response to Comment 2:

The Remedial Investigation/ Feasibility Study Report contains the cost information on the alternatives. The Remedial Investigation Feasibility Study Report can be found at EPA's offices in Philadelphia, Pennsylvania, the Stey Nevant Library in Farrell, PA and online at www.epa.gov/arweb.

3. **Comment 3 from Interested Parties in the Community and other Parties:**

We request the extension of the public comment period by 30 days. The reason for this request is to allow time for interested parties to review in detail the Proposed Plan and other documents related to the Sharon Steel Farrell Works Superfund Site.

EPA Response to Comment 3:

The Environmental Protection Agency granted this request and extended the public comment period another thirty days. The public comment period extension was advertised in the local papers. The public comment period for the Proposed Plan opened on July 16, 2006 and closed on September 13, 2006.

4. **Interested Party Comment 4:** The Proposed Plan (Plan) and subsequent correspondence from the EPA indicate concerns related to potential air borne distribution of Contaminants of Potential Concern (CPOCs). Per the Remedial Investigation Report and the Baseline Human Health Risk Assessment Report (HHRA) "*air sampling was not performed*" and in lieu of air sampling an "*analysis of the potential for contaminants found on the surface of the soils/slag to move into the atmosphere by wind erosion was performed*."

The Air Dispersion Model used assumes that "*for this screening level analysis that the concentrations of contaminants present in the slag/sludge at the Site are uniform across all storage areas and that for each contaminant they are equal to the highest concentration of that contaminant found anywhere on the Site*." "*It was also assumed that all contaminants are either adsorbed onto or absorbed into the dust particles and that the atmospheric emissions from the storage areas would be directly proportional to the slag/sludge concentrations.*"

The Air Dispersion Model was based on a "*dry, exposed surface*" which will "*remain dry and exposed at all times and that the erosion potential is restored after each event*." The "*model was applied using the flat terrain option*" and "*dry and wet deposition effects on the particulate matter emissions were ignored for this analysis, which is a conservative assumption for estimating ground-level concentrations.*" The effects of precipitation and vegetation were "*ignored*" and it was assumed that within one hour after each disturbance the disturbed area was disturbed again. In other words, while in actuality erosion potential diminishes as fines are removed from the surface, the model used assumed that the storage stockpiles were continually being disturbed.

The assumptions on which the Air Dispersion Model is based do not reflect real world conditions at the Site, and are overly conservative. The slag which consistently has a 9 to 10 percent moisture content and is on an irregular surface, and is often shielded by other stockpiled material. Moreover, there are minimal disturbances relative to the size of the Site. Yet the Air Dispersion Model assumed that every particle represented the worst case contamination scenario for all CPOC's, was "*dry*", on a flat unvegetated surface, and was being continually disturbed.

As is stated repeated in the Air Dispersion Model "*conservative"* assumptions and values have been used. Further, the methodology used has been subject to *"conservative modifications.*" These conservative selections and "modifications" may have been in part the result of the RI/FS consultant's incorrect assumption that dust formation "*may be significant during extended periods of dry weather.*" Unlike soils, slag when exposed to extended periods of dry weather, forms an outer crustlike cover which hardens and reduces air borne contamination. During the review required for the Air Quality permit, to escape a hot August sun, the PADEP reviewer and this writer moved to the shadow of the working screening plant. During operations watering of routinely used travelways is often necessary, however, the dust or fine particulate levels common to aggregate quarries where mining of native stone and crushing are required, simply do not exist at a slag recycling Site, in part because of the high moisture levels of slag and in part because there is no need for crushing of the recovered slag.

In the limited time made available, it was not possible to have a thorough review of the Air Dispersion Model by persons more qualified. However, as stated above, it is apparent that the modeling as performed is not representative of the actual conditions at the Site.

EPA Response to Comment 4:
The comment accurately notes that the air/dust dispersion modeling is overly conservative. Modeling was chosen over actual air sampling at the Site due to the highly variable nature of air movement on any given day and the need to economically determine the potential risks associated with dust dispersion. As is common in risk assessments, conservative assumptions are made in the absence of hard data, to err on the side of protecting human health. The air dispersion model was developed by MACTEC, a subcontractor of Black & Veatch who developed the Phase 1 model used in 2001. This model was developed under the guidance of EPA's air modeling and toxicology experts based on the data available for the Site. Although the conclusions of the air modeling study are undoubtedly conservative, EPA believes they are protective of human health and the environment and provide sufficient evidence to conclude that dust migration of Site contaminants represents a pathway of potential concerns that must be considered in the remedial action for the Site.

Interested Party Comment 5:
The Baseline Human Health Risk Assessment Report (HHRA) makes the statement in Section 6.3 "*Hexavalent analysis for chromium is available for some areas, but not all. When hexavalent analysis was not available, total chromium was treated as hexavalent. This may or may not be the case, and may have resulted in an overestimate of risk for some exposure areas and media.*" The HHRA further states that a "*Moderate to high uncertainty is associated with the acute toxicity criteria used in the analysis.*"

Specific to Risk Characterization, the HHRA states, "*Overall, there is a bias for overestimation of potential human health risks at Sharon Steel Farrell Works. It is especially high for the RME (reasonable maximum exposure) through each pathway evaluated. Assumptions regarding* *exposure were selected to error on the side of overestimation to ensure a conservative evaluation of risk. As a result of these conservative assumptions, the potential risk to some human receptors was likely overestimated and there is a moderate degree of uncertainty associated with the analysis.*"

The assumptions regarding exposure are misrepresentative of real world conditions. A review of analyses performed in the Southern Slag Pile Area, where there is an active approved program of slag recovery, reveals that in an area where the placement of steel mill slag would result in higher concentrations of metals of 123 separate analyses, 122 were for total chromium and three (3) were for hexavalent chromium. Of the three analyses for hexavalent chromium (at levels of 16.3 mg/kg, 12.1 mg/kg and 0.44 mg/kg) comparison data with total chromium was possible for two (1,220 mg/kg vs. 16.3 mg/kg and 1,220 mg/kg vs. 12.1 mg/kg.)

More representative are the slag analyses done for the General Permit for Beneficial Use which requires routine analyses for both total chromium and hexavalent chromium. The quarterly analyses for total chromium and total hexavalent chromium are performed using detection levels of 2,200 and 25 mg/kg respectively. Of these 14 sampling and analysis events to date, chromium levels have ranged between 160 and (more typically) 1,600 to <2,200 mg/kg. The hexavalent chromium levels have always been <25 mg/kg and for three events where the detection levels were less than 25 mg/kg the hexavalent chromium was found to be <0.50 mg/kg, 4.0 mg/kg and <0.50 mg/kg.

As part of the preparation of the comments, three (3) separate analyses were performed for total chromium and total hexavalent chromium from samples collected directly beneath the screening plant at approximately 20 feet out from the center, the center and again 20 feet out from the center. The results for chromium and hexavalent chromium were 1,400 mg/kg vs. <2.6 mg/kg, 1,600 mg/kg vs. <2.7 mg/kg, and 1,400 mg/kg vs. <2.6 mg/kg respectively.

The analyses for chromium and hexavalent chromium performed as part of the quarterly sampling events and the three analyses performed on samples collected directly beneath the screening plant, support the conclusions of a included report which has been provided by the Pennsylvania Dept. of Environmental Protection and prepared by Carnegie Mellon University, "The Possibility of Hexavalent Chromium Formation in Steelmaking Slags". The treatment of all chromium analyses as hexavalent chromium is a scientifically flawed assumption.

EPA Response to Comment 5:
It is agreed that there is some uncertainty associated with the assumption that hexavalent chromium may exist at certain exposure areas at the Sharon Steel Farrell Works Site. Based on the remedial investigation sampling results, chromium is present in soils/slag at the Sharon Steel Farrell Works Site in both trivalent (Cr^{+3}) and hexavalent (Cr^{+6}) forms. Hexavalent chromium was actually detected in 11 soil/slag samples collected during the remedial investigation. These data were used to determine that hexavalent chromium was not a concern at several exposure areas. However, hexavalent chromium was not analyzed in all soil/slag exposure areas and therefore it could not be completely eliminated as a constituent of concern at the Sharon Steel Farrell Works Site. The treatment of total chromium as (Cr^{+6}) in those cases where only total chromium data were available is completely consistent with the risk assessment methods used at other Sites in EPA Region 3. It is current EPA Region 3 risk assessment policy to assume that the most toxic form of chromium (Cr^{+6}) may be present whenever detailed hexavalent chromium analysis is not available.

It is agreed that this assumption may result in an overestimation of risk in those cases where hexavalent chromium is not actually present, however it is preferred by EPA over the alternative underestimation of risk associated with the approach of assuming that the less toxic form (trivalent chromium) is present, where hexavalent chromium may actually be present. The assumption that hexavalent chromium may be present is conservative and favors the protection of public health.

Additional sampling for hexavalent chromium could help reduce uncertainty in the risk assessment; however, chromium is not the only chemical driving the need for remediation of soil/slag at the Sharon Steel Farrell Works Site. Other constituents of concern in soil/slag include Benzo(a)pyrene and several additional metals (aluminum, arsenic, barium, cadmium, iron, lead, manganese, nickel, thallium, vanadium, and zinc). If additional sampling was conducted and hexavalent chromium could be completely eliminated as a chemical of potential concern, the other constituents would still be a concern for public health.

The selected remediation alternative for the Sharon Steel Farrell Works Site not only addresses chromium, but also addresses the other constituents of concern identified in soil. The elimination of chromium as a chemical of concern would not change the selected remediation alternative for this Site, and consequently would have no impact on the Proposed Plan.

Interested Party Comment 6:
Upon a review of the Cost Estimate for Alternative 4 we offer the following;"IC""Fencing" As discussed during the July 26 public meeting, controlling trespassers on this Site with its large perimeter is not possible. This is a waste of nearly $700,000.00.

"CAP" "Clearing/Grubbing/Disposal" BOF Sludge Area only. We concur with the recommended use of biosolids as a method of remediation for this area, however, we question the advisability of disturbing these soils in this area any more than is absolutely required to achieve a surface with suitable drainage. We would recommend that consideration be given to clearing and grubbing the area of large vegetation, grading the area minimally as required for drainage and then applying a covering of mixed biosolids and uncontaminated soil brought in from off Site. Even though this area has been subject to extensive sampling and analysis, the process of excavating in preparation for the biosolid cover may result in circumstances where unanticipated expenses will result. Also, the placement of a layer of uncontaminated soil over this area, even when mixed with the very uppermost level of the soils of the BOF sludge area, will improve the general perception of this area and minimize potential future disturbance by inevitable trespassers such as users of recreational vehicles, hikers and hunters. As there will be no slag recovery or mining activities in the BOF Sludge area, it should be confirmed that the Bevill Exemption applies to this area.

"Grading" Assuming this only applies to regrading the surface to provide contours suitable for drainage, an estimated cost of $3.00 to $4.00 per cubic yard is more accurate for estimating. If the intent is to excavate the material, mix in the biosolids and the replace the mixed biosolids and excavated soil without compaction add $1.00 per cubic yard. If compaction is required to ensure stability and limit erosion the placement cost can be estimated at $3.00 per cubic yard. Also, the excavation of the slag can be very difficult and damaging to equipment. Not included in the above is the cost of the transportation and mixing of the biosolids. The estimated cost of $1.55 per cubic yard appears to be unrealistic.

"Cover (Biosolids Enhanced)" This is described as "*Assumes 1/4" polypropylene/clay liner and 8" topsoil"*. Presently the resin required to make

1/4" polypropylene liner costs the equivalent of $2.00 per sq. ft. This does not include the cost of making the liner, transporting it to the Site and installing it. A 1/4" polypropylene liner will not be a flexible liner. This will require welding individual sheets to form a continuous liner. Assuming the liner is to be beneath the clay or at least the topsoil, placing 204,400 cubic yards of topsoil will require special care to avoid destroying the liner. As described, this part of the cost estimate is inaccurate by a factor of 10 or more.

"Stormwater Controls" The estimate of $25.00 per L.F. with three outlet structures seems low for estimating purposes. If excavation in slag is required the excavation costs could be significantly greater. The selection of CMP for use in potentially corrosive circumstances seems inappropriate.

EPA Response Comment to Comment 6:

(a) Fencing: While EPA would acknowledge that attempting to eliminate trespasser access to the Site with fencing will be difficult, EPA also has an obligation to protect human health. The placement of perimeter fencing and signage will serve to inform the public and potential trespassers of the risks associated with entering the Site or disturbing the ongoing remedial operations and will discourage trespassing. Fencing in the northern area of the Site will be temporary and will only be maintained until the vegetated cover can establish itself.

(b) Cap: Grading activities proposed in the BOF sludge area are required to eliminate the ongoing erosion of sludge material into the Shenango River and to stabilize the stream bank. The costs associated with this work have been factored into the estimate for this remedial alternative; however, the grading specifics, and the associated costs will be refined as part of the detailed remedial design plans which will be developed in the next phase of this project.

(c) Grading: The grading costs are estimated in the FS within a range of -50 to +30 percent and are based on published costs for earthwork, modified by the specific soil conditions. The cost for the biosolid material, transportation, and application/mixing of that material into the slag were developed from information provided by Nature's Blend and Synagro, applicators of biosolid material in Warren, OH and Pittsburgh, PA, respectively. The specifics concerning the detailed volume of earthwork required for the project, and the associated costs, will be refined as part of the detailed remedial design plans which will be developed in the next phase of this project.

(d) Cover (biosolids enhanced): This comment appears to be taken out of context as the biosolid option does not use a polypropylene liner. It was proposed as one of the cover options under Alternatives 3 and 6. Again, the costs estimated in the FS are expected to be within a range of -50 to +30 percent and are based on published costs for materials, modified by the specific Site conditions. Regardless, the selected alternative that is being pursued in the Record of Decision, does not require a liner; therefore, this comment will not affect the implementation of the remedy.

(e) Stormwater Controls: Excavation costs associated with grading for stormwater management are included in the overall grading costs and have been incorporated into the Record of Decision. We would concur that corrugated metal pipe (CMP) would be an inappropriate pipe material due to the Site conditions. The specific design elements of the stormwater management system will be more accurately defined in the remedial design plans.

Interested Party Comment 7:

A review of the descriptions of Alternative 4. in the Plan and the Cost Estimate does not provide detail describing remediation of the alkaline ponds. There are alternatives such as constructed wetlands which should be given consideration.

EPA Response Comment to Comment 7:
The proposed plan does not recommend specific remedial activities in the alkaline ponds as they do not provide any habitat value at the present time and are serving as a valuable purpose in buffering pH between the slag piles and the wetland areas and larger ponds downstream. In fact, the alkaline ponds and the emergent wetland area appear to serve as an effective filtration system based on the low contaminants levels observed at the discharge of the tributary into the Shenango River. The Record of Decision does require long-term monitoring to ensure the continuing function and health of this wetland/pond complex during the continuing mining operations and after the placement of biosolid material.

Interested Party Comment 8:
The placement of cover over areas which are zoned industrial and which are part of or contiguous to a KOZ (Keystone Opportunity Zone) only serves to drive development to greenfield areas while reducing the community's tax base. During the July 26 public hearing the EPA stated, in reference to prospective purchasers, "*if they damage the cap they become a responsible party for a new investigation.*" This circumstance alone will prevent the use of these areas if the proposed cap is installed. The EPA's own press release issued following the bankruptcy auction stated, "*Recycling the slag will kick-start the productive reuse of this abandoned property in Mercer County.*" As the release further stated, "*EPA has determined that the removal and reuse of the slag would provide public benefit by significantly reducing the extent and expense of EPA's current cleanup."* As described in the Plan, the removal of several million tons of slag will significantly reduce the EPA's cleanup costs. This removal will also provide a significant opportunity to further monitor the slag and the groundwater surrounding the Site.

It would seem a more effective approach would be to reassess the considerations in Comments 1. and 2. and then re-think the approach for those areas which are predominately covered with slag. The Plan's Site-Related Ecological Risk states, "*the source areas are mostly barren slag piles that provide minimal ecological habitat; therefore, there are no current risks to wildlife."* A reconsideration of the risks associated with the slag is warranted.

The determination that a cover of any type is required for the protection of human health and safety and the environment at this slag- recycling Site, which is unique only because it is part of a Superfund Site, creates dubious precedent which places the concept of slag recycling at risk throughout the United States.

EPA Response to Comment 8:
The proposed plan clearly indicates that only those areas not proposed for mining, left in place after mining is complete, will be remediated using the biosolids. Therefore, there does not appear to be an apparent conflict with the concept of slag recycling – this remedy is proposed for areas that either will not be mined, or that have already been mined. The redevelopment potential of the Site for industrial or commercial uses can be considered at the point when there is a serious plan put forward concerning redevelopment of the property. EPA would welcome redevelopment of the property in a manner that would be protective of the remedy. As of this date, EPA is not aware of any firm plans for redevelopment of the property. Should a developer become interested in reusing portions of this Site, EPA would encourage the developer to work in conjunction with EPA. It would be essential that design plans for Site redevelopment consider the land use restrictions and incorporate design elements to continue to achieve the remedial goals.

Interested Party Comment 9:
Plan makes repeated reference to "*contaminated waste slag*." The slag is accurately described as an unused by-product of the steel making process. The slag is presently being recovered for recycle, as is being done at similar locations throughout the country. As described in Comment 5. above, the slag at the former Sharon Steel Site is typical of slag from any number of large integrated steel mills, closed and active throughout the country. We have discussed the use of the phrase "*contaminated waste slag*" as used in the Proposed Plan with the Pennsylvania Dept. of Environmental Protection, Bureau of Waste Management which issued the General Permit for Beneficial Use for this Site and several slag recycling Sites throughout the Commonwealth. In the form of a statement which has been reviewed, amended and approved by the Department, we offer the following response:

"Slag is produced as a by-product of the iron and steel manufacturing process. Iron and various alloy metals are by the very process a constituent of all iron and steel slag."

"The Proposed Plan makes continuing reference to "contaminated" slag. The Plan and the Prospective Purchaser Agreement with the EPA and subsequent correspondence with the EPA have approved the processed slag for beneficial use. The recovery and processing of the slag as permitted by PA DEP General Permit WMGR082, the conditions of which apply to several Sites throughout the Commonwealth, ensures "contaminated" slag is not distributed for beneficial use by establishing levels for the metals and alloys which are not to be exceeded."

"A review of the samplings and analyses performed as required by the General Permit shows that there has been only one exceedance since the 4th quarter 2003 when the sampling was initiated. This was for total thallium (9.4 vs 6.0 mg/kg). As required by the permit, subsequent sampling and analyses determined the processed slag suitable for beneficial use. These quarterly analyses include determination for hexavalent chromium (Cr+6)."

"The results of these samplings and analyses are consistent with those performed by the EPA as part of the RIFS, conducted from 1999 to 2003".

"Simply put, by its very nature iron and steel mill slag will contain metals and alloys. Slag is "contaminated" only when the levels of these metals and alloys exceed acceptable levels established in the General Permit. Only slag containing metals, alloys and other constituents at levels greater than those established in the General Permit limits are considered unsuitable for beneficial use. To refer to all slag at this Site as "contaminated", misrepresents the conditions observed to date."

EPA Response to Comment 9:
This comment takes exception to defining the slag material as "contaminated waste slag" based on the PADEP definition of slag as part of the General Permit for recovery and processing of slag. It is important to note that different programs use different words to describe contaminated areas. Under CERCLA, materials may be considered contaminated if they have detectable levels of a particular contaminants above normal levels. Our use of the word "contaminated" is not intended to imply anything with respect to the PADEP permit and simply describes the material as contaminated based on the criteria in CERCLA.

Interested Party Comment 10:
In the letter, the interested party states that the preferred alternative in the proposed plan should be revised because of specified assumptions it made regarding chromium in soils. They also stated that the alkaline conditions in the wetlands could be more cost-effectively and less intrusively remediated. Additionally, they requested an extension of the comment period for the Proposed Plan.

EPA Response to Comment 10:
September 13th was the close of the 30-day extension to the original comment period. The wetlands in the southern portion of the Site will not be disturbed as part of the remedy selected (See page 49 of the Record of Decision for information on the selected remedy).